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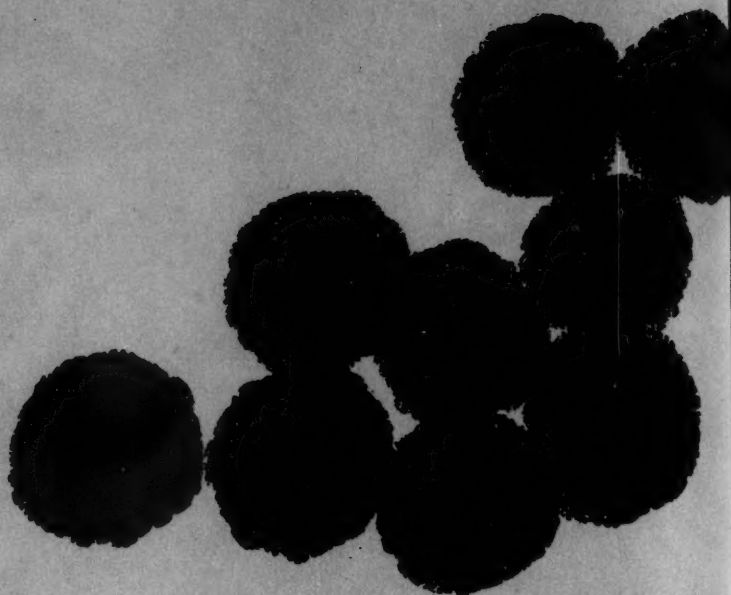
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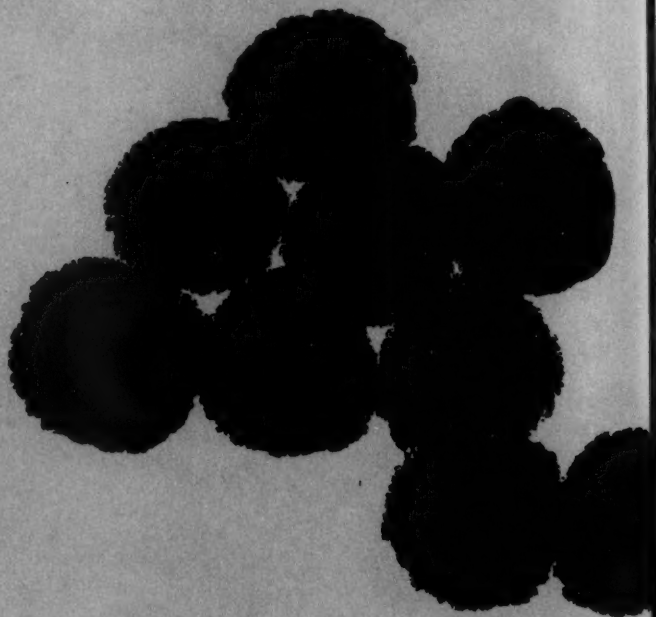
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MARYLAND

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Fort Howard Hospital Issue



FORT HOWARD HOSPITAL

FOREWORD

The Staff of the Veterans Administration Hospital, Fort Howard, Maryland, is grateful to the Editor of the Maryland State Medical Journal for the invitation to supply the scientific articles for this issue. The request was made with the opinion that the smaller hospitals of the State, of which this is a representative, would have untapped ability in their staffs. With this concept in mind, the members of this Hospital were asked to submit manuscripts for this issue. The varied facets of hospital practice are portrayed in the subjects chosen. It was a pleasure to write these articles. The Staff of this Hospital hopes that the members of the Medical and Chirurgical Faculty of the State of Maryland will enjoy reading them.

Joseph M. Meehan, M.D.

Chief of Surgical Service

Scientific Papers

NEURITIS FOLLOWING SERUM THERAPY

FRANCIS G. DICKEY, M.D.*

Peripheral neuritis, one of the most frequent neurological conditions seen at the Fort Howard Hospital, usually occurs subsequent to nutritional deficiencies associated with diabetes or alcoholism. Following therapy, individuals so affected are usually left with a minimum of residual neurological change although occasionally the end result may be poor. Rarely one sees a more serious type of neuritis following the use of an antiserum. Recently, we have noted two instances in which peripheral neuritis followed the injection of tetanus antitoxin. It seemed of interest to report these two patients, to call attention to this not infrequent complication, to emphasize that it may be quite disabling and to consider its treatment.

Descriptions of serum neuritis appeared shortly after the various types of antisera came into general use. It is usually accepted that Englemann (1) in 1897 first described this complication and since then there have been a number of reports dealing with the various neurological manifestations resulting from the use of an antiserum in a sensitive individual. Usually the neurological signs follow shortly after the appearance of serum sickness and are accompanied by severe pain. Most frequently the nerves of the brachial plexus are involved with the production of the Erb-Duchenne or upper arm type of paralysis. It is this variation that occurred in our two patients.

CASE REPORTS

Case 1. This 31 year old white man was admitted on October 31, 1952, complaining of weakness of the left arm of one month's duration. On September 20, 1952, he

received in the right deltoid region an injection of tetanus antiserum following a laceration of the upper lip. On September 29, aching in the left elbow was noted and this spread upward over the arm and shoulder, crossing into the right arm. On October 1, he noted that he could not raise his left arm. Following this, he consulted his physician who prescribed a sling and heat treatments. Because there was no improvement, he was referred to this hospital.

Weakness of the deltoid, biceps and triceps muscle groups of the left arm was present. Motor power of all other muscles was excellent. Coordination and a complete sensory examination were normal. The deep tendon reflexes were absent in the left upper extremity, with the remainder of the reflexes within normal limits. Electrical stimulation revealed diminished response to Faradic current requiring double the intensity to produce a minimal muscle contraction as compared to the normal right side.

Treatment consisted of infra-red radiation to the musculature of the left shoulder girdle and re-educational exercises. Gradually there was improvement in the ability to abduct the left arm with lessening of the atrophy and return of the Faradic excitability to almost normal. There was still slight weakness of the deltoid muscle. The patient was discharged on December 24, 1952, with instructions to continue a program of shoulder exercises.

Case 2. This 38 year old white male was admitted on February 2, 1953, with the complaint of pain and weakness in the right arm of 8 weeks' duration. One week prior to the onset of the present illness, he received tetanus antiserum because of a cut with a milk bottle. This was followed by the development of excruciating pain in both arms, shoulders and the back of the neck. Both arms became partially paralyzed, and this showed only slight improvement. Pain continued in the arms, chiefly at night. There was a burning sensation down the back of the left leg.

Atrophy and marked weakness of the muscles of both arms and shoulder girdles with diminished deep tendon reflexes of these muscles were present. There were no sensory changes and the cranial nerves were intact. The lower extremities were normal. A weak re-

* From the Medical Service.



FIG. 1. Showing atrophy of both arms and shoulder girdles, more marked on the right side.

sponse to high intensity Faradic current and a sluggish response to galvanic current was found in the muscles of both shoulder girdles and arms.

Treatment consisted of heat applied to the weakened muscles, electrical stimulation and re-educational exercises. Function and power in the left upper extremity and shoulder girdle returned to 75 per cent of normal and of the right upper extremity to about 50 per cent of normal. It was felt that this patient would continue to improve slowly without further specific therapy, provided he continued to use the upper extremities. Because of personal problems at home, he was discharged on March 13, 1953.

COMMENT

Each of these patients shows one of the more common types of neurological manifestations following the use of antitetanus serum. The first had a peripheral neuritis involving primarily the brachial plexus, and the second signs and symp-

toms of a more diffuse polyneuritis. Both had disability extending over many months indicating the serious nature of the disease. Mild cases may recover in four to six weeks. If, after six weeks, atrophy develops and paralysis continues, the prognosis is only fair and there may be incomplete return of function. Even more rarely does one find cranial nerve involvement. Comroe and his coworkers (2) have reported a case of neuritis with involvement of the muscles of respiration following the administration of tetanus antitoxin.

The theory commonly held to explain this nerve involvement is the presence of edema of the nerve trunk with constriction and impairment of function. This edema is similar to that occurring in hypersensitive states such as urticaria and serum sickness.

The incidence of this disabling complication indicates the advisability of universal active immunization with tetanus toxoid. While it is true that many children and members of the Armed Forces have in the more recent past been immunized with tetanus toxoid, the lack of clearcut conclusions concerning the duration of the immunity thereafter has resulted in the continued use of tetanus antiserum. Recent work by Turner, Stafford and Goldman (3) in which serum antitoxin determinations were made on 145 adults previously immunized with tetanus toxoid, resulted in the conclusion that once basic tetanus immunization has been established, stimulating doses at 5 year intervals provide satisfactory antitoxin levels, and booster doses even at 10 year intervals would provide satisfactory antitoxin levels for most persons.

The treatment of neuritis following serum therapy is only partially successful. The paralysis appears quickly and unexpectedly and, in spite of measures customarily used to treat serum sickness, may progress. The administration of epinephrin and antihistaminic drugs are indicated, but derivation of benefit is questionable. Fetter (4), using cortisone, reported relief of arthralgia in his patient, but there was only slow

recovery from the paralysis. Following the acute phase, the chief dependence must be placed on physiotherapy. Electrical stimulation, muscle training and re-education offer maximum benefit for the muscle groups which remain paralyzed. A well planned program involving these activities will gradually improve the motor function of the muscles involved.

SUMMARY

The details of two patients with peripheral neuritis following the use of tetanus antiserum are reported. The lesions were of the most common type, involving the brachial plexus. Active immunization for tetanus followed by booster injections of tetanus toxoid to maintain an adequate titer of antibody is urged to avoid the

occurrence of neuritis following the prophylactic administration of tetanus antitoxin. Treatment of the neuritis consists chiefly of physiotherapeutic methods, used following the acute phase.

*Veterans Administration Hospital
Fort Howard, Maryland*

BIBLIOGRAPHY

1. YOUNG, F.: Peripheral nerve paralyses following the use of various serums. *J.A.M.A.* **98**: 1139, 1932.
2. COMROE, J. H., JR., WOOD, F. C., KAY, C. F., AND SPOONT, E. M.: Motor neuritis after tetanus antitoxin with involvement of the muscles of respiration. *Am. J. Med.* **10**: 786, 1951.
3. TURNER, THOMAS B., STAFFORD, EDWARD S., AND GOLDMAN, LEON: Studies on the Duration of Protection Afforded by Active Immunization Against Tetanus. *Bull. Johns Hopkins Hosp.* **94**: 204, 1954.
4. FETTER, F.: Peripheral neuritis from tetanus antitoxin. *Am. J. Med.* **14**: 137, 1953.

DENTIGEROUS CYST OF MANDIBLE

FREDERICK S. MAIER, D.D.S. AND THADDEUS WEGLARSKI, D.D.S.*



FIG. 1. Roentgenogram showing dentigerous cyst in the mandible.



FIG. 2. Roentgenogram taken 12 weeks after operation

A 38 year old white man was admitted to the hospital on June 10, 1954, with the chief complaint of a cyst in the mandible. Pain started in the left side of his mouth approximately June 6,

* From the Dental Service.

1954. Four days later because the pain was still present, he went to the Veterans Administration Baltimore Regional Office. A roentgenogram of the mandible showed a large cyst. There was a slight, non-tender swelling in the region of the left mental foramen. The teeth of the mandible



FIG. 3. Patient without dental restoration showing defect



FIG. 4. Patient with restoration inserted

were on an abnormal plane at their highest point in the molar area on the left and inclined downward to the incisor area.

The roentgenogram of the mandible showed a cyst which extended from the lower left second molar to the lower right first bicuspid. The lower right cuspid was impacted in the cyst and the bone was extremely thin. A diagnosis of dentigerous cyst was made. Removal was recommended to prevent progression of growth and to avoid spontaneous fracture.

On June 17, 1954, with the patient under a general anesthetic, all of the teeth over the cyst, from the lower left second bicuspid around to the lower right central, were removed in addition to the lower left third molar. The mucous membrane over the cyst was incised on the crest of the ridge and reflected forward exposing the thin bone. This was removed with rongeur forceps. The unerupted cuspid was removed and the cystic cavity was thoroughly curetted. The mucous membrane was trimmed and the cavity was packed with iodoform gauze impregnated with Dentalone. A partial closure of the incision

was effected with black silk sutures. The post-operative course was uncomplicated.

The cyst was filled with grayish-white debris resembling epithelium. A small amount of fresh hemorrhage was seen and some of the contents had a silvery sheen suggesting cholesterol microscopically, the wall of the cyst was formed by stroma which had most of its surface lined by squamous epithelium. A diagnosis of a dentigerous cyst was made.

The patient was discharged from the hospital on June 29, 1954. Because of the nature of his job as a policeman he was placed in some position which would not expose him to any danger of fracture. He returned at regular intervals for clinical examinations and roentgenograms.

On September 9, 1954, the roentgenogram showed regeneration. On October 11, 1954, impressions were taken for a denture which was inserted on November 10, 1954. The function of the mandible was good.

*Veterans Administration Hospital
Fort Howard, Maryland
(Dr. Maier and Dr. Weglarski)*

GOVERNOR'S SAFETY-HEALTH CONFERENCE

The Governor's Safety-Health Conference and Exhibit will be held at the Lord Baltimore Hotel on May 5 and 6. The exhibits and lectures will cover a wide range of Safety and Occupational Health topics.

CLINICAL EXPERIENCE WITH THE INJECTION OF STREPTOKINASE INTRAMUSCULARLY IN THE TREATMENT OF INFECTION AND EDEMA

JOSEPH M. MILLER, M.D., JOHN A. SURMONTE, M.D., MILTON GINSBERG, M.D.,
AND FRANK B. ABLONDI, A.B.*

The ability of trypsin to influence the inflammatory reaction has been demonstrated (1, 2, 3). This phenomenon may be mediated by plasmin. It was of interest to determine whether an anti-inflammatory effect or an anti-edema effect could be produced by the intramuscular administration of streptokinase, a known activator of plasminogen. Before a detailed discussion of the results of such treatment in patients is considered, however, some thought should be given to the details of the inflammatory reaction and whether or not its modification would benefit the patient.

Inflammation is the composite picture of the changes in the tissues in response to a number of injurious agents and includes the process of repair. The cellular response to the inciting agent has drawn most of the interest during the last years. It is apparent now that the consistency of the edema fluid and the presence or absence of natural antibodies in the area of inflammation must influence the response seen to a considerable degree.

The development of the acute inflammatory reaction is conditioned by the nature of the injuring agent, the tissue involved and the immune defenses of the patient. An excessive vascularization characterizes the local response. The capillary endothelium is injured and becomes more permeable allowing fluid to pass more freely into the tissues. The exudation of a viscous fluid is enhanced by an elevation of the capillary blood pressure and a slowing of the flow of the blood.

* From the Surgical Service (Dr. Miller, Dr. Surmonte, and Dr. Ginsberg); The Department of Surgery, The Johns Hopkins School of Medicine (Dr. Miller and Dr. Ginsberg); and the Lederle Laboratories Division, American Cyanamid Company (Mr. Ablondi).

The excessive amount of tissue fluid may help to dilute the toxic agents locally. The arterioles and venules dilate. The area is first invaded by polymorphonuclear neutrophilic leukocytes which are replaced later by mononuclear cells. The coagulation of fibrin in the tissue fluids and the formation of thrombi in the arteries, capillaries, veins and lymphatics of the area help to localize the infection.

The fibrin deposited in the tissue spaces may be a disadvantage since it may enmesh the polymorphonuclear neutrophilic leukocytes and interfere with mobility and consequent phagocytic action. In addition, bacteria, engulfed by these cells, may multiply intracellularly, particularly where the cells are precipitated in a network of fibrin. The humoral forces responsible for cure of the infection cannot reach the bacteria.

The degree of infection in the tissues depends upon the virulence of the bacteria and the nature of the bodily defenses. The adjunct use of the chemotherapeutic and antibiotic agents aids the natural defenses of the body considerably in combating infection.

Paradoxically, the features of the inflammatory reaction which localize the infection are barriers to the effective action of the humeral, chemotherapeutic and antibiotic agents. The edema fluid contains a large amount of fibrin which hinders phagocytosis. The edema fluid causes a swelling in the area of infection with compression of the blood vessels and consequent impairment of the circulation. The formation of fibrin thrombi in the blood vessels and lymphatics further impairs the local circulation.

The removal of any of these factors should aid bodily defenses and drugs to attack the bac-

teria more successfully. Observations in patients with infections and edema indicate that profound changes in reversing these states can be effected by the intramuscular administration of streptokinase. The mechanics of the action are at present presumptions and not proven by microscopic examinations or chemical analyses. It is assumed that fibrin in the edema fluid is digested. The viscosity of the edema fluid is reduced. The fibrin clots in the local vascular and lymphatic systems are dissolved and the edema fluid is absorbed. The net result is an improvement in the local vascular and lymphatic circulations. The humoral agents and the administered drugs can reach the bacteria in greater concentrations and combat them more effectively.

The chemotherapeutic and the antibiotic agents are known to exert their greatest effect in cellulitis. If the inflammatory reaction can be restrained to a cellulitis and tissue necrosis avoided, the humoral forces of the patient and the antibacterial agents can act more effectively upon the bacteria.

Varidase is composed of streptokinase and streptodornase, the latter of which is actually a group of depolymerases. The effects achieved here by varidase can be ascribed to the action of streptokinase since the observed therapeutic effects were not produced by the intramuscular administration of a pure preparation of streptodornase.

The anti-inflammatory and anti-edema effects of streptokinase were investigated in three ways. In the first, streptokinase was added to the blood plasma of the patient. In the second, streptokinase was given intramuscularly. In the third, streptokinase was added to an aqueous solution of polyvinyl pyrrolidene in the hope that the latter would act as a retarding agent in the absorption of the former.

STREPTOKINASE AND BLOOD PLASMA OF THE PATIENT

Under sterile precautions, 15 cc. of the blood of the patient was collected and added to 3 cc. of Baxter's anticoagulant acid citrate dextrose

TABLE 1
Results of Treatment of Patients with Streptokinase and Blood Plasma of the Patient

Condition Treated	Total	Excellent	Good	Not Beneficial
Abscess.....	11	5	5	1
Cellulitis.....	5	5	0	0
Empyema.....	2	0	2	0
Epididymitis.....	4	4	0	0
Glaucoma.....	1	1	0	0
Hemorrhoid, thrombotic.	1	0	1	0
Thrombophlebitis.....	3	3	0	0
	27	18	8	1

solution, Formula B, in a screw-capped test tube. The test tube was inverted for mixing and then stored in a refrigerator until processed. The unclotted blood was centrifuged at 1500 revolutions per minute for 15 minutes. The plasma was removed by needle and syringe and then placed in a sterile rubber stoppered vaccine vial. Varidase was dissolved in physiologic saline so that the final concentration of streptokinase was 10,000 units per cc. A fresh solution of varidase was made daily. The ampoule was stored in the refrigerator when not being used. One half cc. of the solution of streptokinase containing 5,000 units and one-half cc. of blood plasma was combined. The combination was shaken and given intramuscularly immediately. The treatment was given twice a day for three days. Twenty-seven patients were treated in this manner and the results are shown in table 1. The one poor result in this group was in a patient with paraplegia who had extensive decubiti which were resistant to all forms of treatment. The combination of infection and poor circulation made it very difficult to obtain healing of the decubiti.

STREPTOKINASE

Varidase was dissolved in physiologic saline so that the final concentration of streptokinase was 10,000 units per cc. The ampoule was stored in the refrigerator when not being used. A fresh solution was made daily. Five thousand units of streptokinase in 0.5 cc. of physiologic saline

TABLE 2
Results of Treatment of Patients with Streptokinase

Condition Treated	Total	Excellent	Good	Not Beneficial
Abscess.....	2	0	1	1
Cellulitis.....	6	6	0	0
Edema.....	14	10	3	1
Epididymitis.....	1	1	0	0
Hemarthrosis.....	1	0	1	0
Sinusitis.....	1	1	0	0
Thrombophlebitis.....	2	2	0	0
	27	20	5	2

were given intramuscularly twice a day for three days. Twenty-seven patients were treated in this manner and the results are shown in table 2. The two poor results in this group were in patients who had arteriosclerotic vascular disease with gangrene.

STREPTOKINASE AND POLYVINYL PYRROLIDONE

Varidase was dissolved in physiologic saline so that the final concentration of streptokinase was 10,000 units per cc. One-half cc. of a freshly prepared solution of streptokinase was added to 0.5 cc. of a 15 per cent aqueous solution of polyvinyl pyrrolidone. The combination was shaken and given once intramuscularly immediately. The polyvinyl pyrrolidone was used as an agent to prolong absorption. One injection was given intramuscularly. Five patients were treated in this manner and the results are shown in table 3. The poor results in this group was apparently due to insufficient treatment.

TABLE 3
Results of Treatment of Patients with Streptokinase in Polyvinyl Pyrrolidone

Condition Treated	Total	Excellent	Good	Not Beneficial
Cellulitis.....	1	1	0	0
Edema.....	1	0	1	0
Hemorrhoids, thrombotic	1	0	0	1
Thrombophlebitis.....	2	2	0	0
	5	3	1	1

STREPTODORNASE

Since Varidase contains streptokinase and streptodornase, it was necessary to determine whether a beneficial therapeutic effect could be obtained from the intramuscular administration of streptodornase. Streptodornase was dissolved in physiologic saline so that the final concentration was 10,000 units per cc. The solution was stored in the refrigerator when not being used. A fresh solution was made daily. Five thousand units of streptodornase in 0.5 cc. of physiologic saline was given intramuscularly twice daily for three days. Six patients were treated in this manner and the results are shown in table 4.

Three of the six patients were then treated with streptokinase in an effort to improve the results. The results are shown in table 5.

HYALURONIDASE

Varidase also contains small amounts of hyaluronidase. The lot of varidase used contained about three turbidity-reducing units of hyaluronidase to 5,000 units of streptokinase. It was necessary to determine whether a beneficial therapeutic effect could be obtained from

TABLE 4
Results of Treatment of Patients with Streptodornase

Condition Treated	Total	Excellent	Good	Not Beneficial
Cellulitis.....	1	0	0	1
Edema.....	2	0	0	2
Orchitis, mumps.....	1	0	0	1
Thrombophlebitis.....	2	0	0	2
	6	0	0	6

TABLE 5
Results of Treatment of Patients with Streptodornase Followed by Streptokinase

Condition Treated	Total	Excellent	Good	Not Beneficial
Edema.....	1	0	1	0
Orchitis, mumps.....	1	1	0	0
Thrombophlebitis.....	1	1	0	0
	3	2	1	0

TABLE 6
Results of Treatment of Patients with Wydase

Condition Treated	Total	Excellent	Good	Not Beneficial
Cellulitis.....	2	0	0	2
Thrombophlebitis.....	1	0	0	1
	3	0	0	3

TABLE 7
Results of Treatment of Patients with Wydase Followed by Streptokinase

Condition Treated	Total	Excellent	Good	Not Beneficial
Cellulitis.....	1	1	0	0
Thrombophlebitis.....	1	1	0	0
	2	2	0	0

the intramuscular administration of hyaluronidase. Wydase* was dissolved in physiologic saline so that the final concentration was 150 turbidity-reducing units per cc. The solution was stored in the refrigerator when not being used. One hundred fifty turbidity-reducing units of Wydase in one cc. of physiologic saline were given intramuscularly twice daily for three days. Three patients were treated in this manner and the results are shown in table 6.

Two of the three patients were then treated with streptokinase in an effort to improve the results. The results are shown in table 7.

REPORT OF CASES

Case 1. A 24 year old white man was admitted to the medical service of the hospital on July 5, 1954 with symptoms of an ulcer of the jejunum following a partial gastrectomy, for an ulcer of the duodenum done elsewhere in 1948. The patient was seen in surgical consultation on July 16, 1954 and a bilateral vagotomy was recommended. The patient was given penicillin and streptomycin. A bilateral vagotomy through the left side of the thorax was done on August 4. At the time of operation a polythene catheter was inserted in the saphenous vein on the left side just about the level of the medial malleolus of the tibia. The polythene cath-

eter was removed on August 6. On August 8, a thrombophlebitis of the saphenous vein on the left side was noted. Streptokinase, 5,000 units in 0.5 cc. of physiologic saline and 0.5 cc. of the blood plasma of the patient were given twice a day for a total of six doses from August 9 through August 12. On August 10, the erythema had moderately subsided and the vein was less tender. On August 11, the erythema was practically gone, and the vein was not tender. On August 12, the erythema was gone. The patient was discharged from the hospital on August 23.

Case 2. A 28 year old white man was admitted to the surgical service of the hospital on August 13, 1954, with a severe degree of ecchymosis and edema of the face due to trauma incurred in a fight. The roentgenograms of the skull and the bones of the face showed a fracture of the lower part of the lateral wall of the left maxillary accessory nasal sinus with the fragments being in good position. The patient was given procaine penicillin G in aqueous solution, 300,000 units intramuscularly twice a day from August 13 through August 18. He also received 0.5 cc. of tetanus toxoid intramuscularly. Streptokinase, 5,000 units in 0.5 cc. of physiologic saline was given intramuscularly twice a day for six doses from August 13 through August 16. A moderate reduction in edema occurred by August 14 and recession continued during the next two days so that the face was practically normal on August 16. The edema was entirely gone on August 18 with considerable regression of the ecchymosis. The face was practically normal on August 23. The patient was discharged from the hospital on August 24.

COMMENT

Streptokinase evokes a beneficial effect on the inflammatory reaction and the edema within two days after the start of treatment. In all patients, the degree of redness and edema decreased considerably by the end of two days and in a small number of patients, an effect was observed in a period of hours. An aggravation of the infection was not seen in any of the patients. In the patients with granulating wounds, healing was hastened by the reduction of the surrounding induration. A delay in healing was not seen in any of the patients. A rise in temperature attributable to streptokinase was noted in about ten per cent of the patients. A significant change in the white blood cell count or in the differential count was not observed. A significant prolongation of the prothrombin time was not found.

* The Wydase, brand of lypholized hyaluronidase, was supplied by Wyeth, Incorporated, Philadelphia, Pennsylvania.

Fibrinolysis as determined by the whole-blood technique was not observed in periods up to 72 hours after the fifth injection of streptokinase on the third day of treatment. Hemorrhage and the formation of hematomas or petechiae were not seen.

The administration of streptokinase intramuscularly is recommended in the treatment of edema associated with infection and trauma. The best results are seen in infections which do not produce necrosis of tissue such as thrombophlebitis, epididymitis and cellulitis. A chemotherapeutic or antibiotic agent must be given systemically when treatment with streptokinase is given. Streptokinase given intramuscularly to a patient with an abscess is helpful in reducing the accompanying surrounding cellulitis. The use of streptokinase, however, is not a substitute for the employment of sound surgical principles. Incision and provision for drainage of pus is fundamental. The auxiliary use of varidase locally will prove valuable where pus is present. Pain and tenderness was found at the site of injection in about 60 per cent of the patients. The pain and tenderness disappeared in 24 hours to 48 hours after the injections were stopped. The pain and tenderness were probably due to the streptokinase in the varidase since they were not encountered in the six patients given the streptodornase. The formation of a granuloma was not seen in any of the patients. Chills, cyanosis or an allergic response were not noted in any of the patients. The administration of anti-histaminics was not necessary. Streptokinase should not be given intramuscularly to patients with defects in the clotting mechanism due to the possibility of hemorrhage.

The mechanism by which streptokinase given intramuscularly produces a reversal of the inflammatory effect is not yet known. The liquefaction of thrombi of fibrin in arteries, veins and lymphatics, however, improves the local circulation. The decrease in the viscosity of edema fluid, furthermore, aids the process. The total of the two actions permits easier access of the humoral forces of the host to the

bacteria with increased phagocytosis. In addition, the chemotherapeutic or antibiotic agents given concomitantly have easier access to the area of infection.

To obtain good results with the intramuscular injection of streptokinase, adequate circulation of the involved area must be present. The number of injections must be large enough to insure beneficial action. The use of blood plasma in conjunction with streptokinase does not appear to offer any additional advantages over the use of varidase alone. Likewise, the use of polyvinyl pyrrolidone as a retarding agent has not been advantageous since the additional agent complicates treatment and it is felt that a longer series of injections is indicated.

An additional use of streptokinase was demonstrated by the following patient. A 30 year old white man was admitted to the hospital with a mildly infected pilonidal cyst. He was given penicillin and aureomycin and took Sitz baths twice a day. In about eight days, the wound was clean enough to permit operation. An excision of the pilonidal cyst and a primary closure of the wound were done. Because of the increased susceptibility of such wounds to infection and edema, the patient was given the combination of streptokinase and blood plasma twice a day for three days. The wound was healed on the twelfth post-operative day. In this patient, evidence of hemorrhage or a delay in wound healing was not seen.

The five patients with acute epididymitis are worthy of special comment. The pain and tenderness disappeared within about 48 hours. The area of inflammation became softer in about 48 hours with complete resolution at about 5 days. In six patients with acute epididymitis treated similarly but without streptokinase, the pain and tenderness gradually subsided over a period of five to seven days. A much more gradual resolution occurred with the complete state being reached at about nine days.

In a similar manner, the five patients with acute thrombophlebitis lost the pain, tenderness and overlying redness and edema in about 48

hours. The palpable cord in the vein lasted for about seven days. In six comparable patients treated in the same manner but without streptokinase, the pain, tenderness and edema took about 15 days to disappear.

Because of the demonstrated ability of streptokinase when injected intramuscularly to decrease the degree of edema, three patients subjected to craniectomy for a brain tumor were also treated. Two patients were treated preoperatively in the routine manner and in one of these treatment was continued postoperatively for five days. An increased amount of hemorrhage was not observed at the time of operation in either of the patients. In a third patient, treatment was started immediately postoperatively. The clinical course of the patients was most encouraging with the suggestion that the cerebral edema usually consequent to operative trauma was less than usually seen.

A small number of the patients received a longer series of injections. In these patients, an excellent therapeutic effect was obtained by the end of 72 hours but additional treatment was given because of the gravity of the infection and/or the degree of the edema.

SUMMARY

Streptokinase given intramuscularly produces a modification of the inflammatory reaction

and the absorption of edema. Treatment with streptokinase given intramuscularly must be accompanied by the administration of a chemotherapeutic or an antibiotic agent. The use of streptokinase given intramuscularly is not a substitute for sound surgical treatment. Further investigation in the use of streptokinase given intramuscularly is indicated.

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REFERENCES

1. INNERFIELD, I., SCHWARZ, A. AND ANGRIST, A. Intravenous trypsin: its anticoagulant, fibrinolytic and thrombolytic effects. *J. Clin. Investigation* **31**: 1049-1055 (December) 1952.
2. INNERFIELD, I., ANGRIST, A. AND RUGGIERE, W. Intravenous trypsin: its effects upon intravascular thrombi and the acute inflammatory reaction. *Surgical Forum, Proceedings of the forum sessions of the thirty-eighth clinical congress of the American College of Surgeons, New York City, September, 1952, W. B. Saunders Company, Philadelphia and London, 1953, p. 526-530.*
3. INNERFIELD, I., ANGRIST, A. AND SCHWARZ, A. Parenteral administration of trypsin. Clinical effect in 538 patients. *J.A.M.A.* **152**: 597-605 (June 13) 1953.

TRAUMATIC RUPTURE OF THE TESTIS WITHOUT EXTERNAL INJURY

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Traumatic rupture of the testis without external injury is rarely reported. McCrae (4) reviewed 12 cases in 1951 and added 1 personal case, while 3 cases have been subsequently reported (2, 3, 5). Undoubtedly the 16 cases do not represent the true incidence of the condition.

Many traumatic swellings in and around the testis are called hematoceles or traumatic orchitis, but the patients have lacerations of the tunica albuginea of the testis. In these patients, the hemorrhage stops spontaneously, treatment is expectant and the result is satisfactory but the real injury is never known. In the 16 reported cases and in the present instance, the diagnosis

* From the Surgical Service.

of rupture of the testis or laceration of the tunica albuginea of the testis was made by exploration.

Forceful compression of the testis causes intense pain, vomiting, neurogenic shock and prostration. Because of the suspension, the testis usually swings with the applied force and rupture of the tunica albuginea is rare. Analysis of the reported cases (1, 2, 3, 4, 5), suggested that rupture of the tunica albuginea resulted from compression of the testis between the striking object and the pubis or thigh.

The accidents usually occurred during the period of greatest physical activity, for in the reported cases (1, 2, 3, 4, 5) the youngest patient was 8 years, the oldest 49 and the average age 26.62. In the present instance, the rupture of the testicle and several other injuries occurred in an automotive accident. Since automotive accidents are increasing in number, rupture of the testis should be seen more frequently and at any age.

The most prominent and consistent symptom of rupture of the testis is immediate, severe pain in the scrotum, which usually subsides rapidly. Infrequently, nausea, vomiting and neurogenic shock may be severe. When the patient has other major injuries, the symptoms due to rupture of the testis may be obscured, or in the presence of unconsciousness, be unnoticed. A gradually increasing enlargement of the scrotum with tenderness and occasionally ecchymosis is found. It is at this time, that an incorrect diagnosis of hematocele is usually made instead of the correct diagnosis of rupture of the testis. Evacuation of the hematoma will hasten resolution of the inflammatory process in many of the patients and may prevent subsequent atrophy of the testis if the organ can be preserved. If the testis is irreparably damaged, orchidectomy will decrease the period of morbidity.

At the time of exploration of the testis, the procedure done will depend upon the nature and

the degree of injury to the organ. Marked shattering with extrusion of the substance of the testis necessitates orchidectomy. Simple lacerations of the tunica albuginea of the testis may be sutured. When such an operation is not feasible because of resultant excessive pressure from the sutures on the parenchyma, the hemorrhage is controlled and the tunica vaginalis is resected. The laceration is covered by the areolar tissues of the scrotum. Of the 16 reported cases (1, 2, 3, 4, 5), 9 patients had an orchidectomy and 7 a suture of the laceration of the tunica albuginea of the testis. Follow-up reports were not available in most of the patients in whom a suture of the tunica albuginea of the testis was done. In 3 cases where suture of the laceration was performed, the testis was normal and only slightly smaller than the other testis after about 7 years (1), in another the testis was normal in size after about 7 months and in another showed only a slight decrease in size after about 1 month (5).

CASE REPORT

A 34 year old negro man was the victim of a hit and run driver on July 11, 1953. The patient, who was unconscious for about 12 hours, was admitted to another hospital where he was found to have fractures of the left tibia and fibula and multiple lacerations. He was transferred to the Orthopedic Service of the Veterans Administration Hospital, Fort Howard, Maryland on July 13, 1953. The scrotum was massively enlarged and tender. On July 17, 1953, a urological consultation was obtained. The contents of the right side of the scrotum were normal. The left side of the scrotum was swollen to a diameter of about 10 centimeters. The testis and spermatic cord were indistinguishable within a tender and slightly cystic mass. A laceration or ecchymosis of the skin of the scrotum were not present. Aspiration of the mass yielded pure blood. The general condition of the patient, however, precluded definitive treatment of the mass in the left side of the scrotum. On July 12, 1953, resolution of the mass not having occurred and improvement in the general condition of the patient being present, exploration of the scrotum was done. A large amount of clotted blood was evacuated from the distended but intact tunica vaginalis. Multiple lacerations

tions of the tunica albuginea and complete rupture of the lower two-thirds of the testis were present. A repair of the laceration was impossible and orchidectomy was done. Recovery was prompt and uneventful.

SUMMARY

1. The seventeenth known case of traumatic rupture of the testis without external injury is reported.

2. Exploration of the scrotum in patients with persistent swelling of the scrotum following trauma is suggested as soon as possible. Repair of the ruptured testis should be done, if possible, to preserve the testis with the hope that the atrophy will not occur. Orchidectomy, where

irreparable damage of the testis is present, will decrease morbidity.

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REFERENCES

1. CAMPBELL, M. F. *Pediatric Urology*, New York, The Macmillan Company, 1937, vol. 2, p. 188.
2. DUNDON, C. Rupture of the testicle. *Lancet* **1**: 903 (May 3) 1952.
3. LONG, A. Traumatic rupture of the testicle. *J. Roy. Nav. M. Serv.* **38**: 31 (Winter) 1952.
4. MCCRAE, L. E. Rupture of the testicle. *J. Urol.* **66**: 270-273 (August) 1953.
5. TRABUCCO, A., COMOTTO, C. AND AMENDOLARA, F. Traumatismo con ruptura del testiculo. *Rev. argent. de urol.* **20**: 46-48 (January-April) 1951.

STEROID DIABETES

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Diabetes mellitus, either overt or latent, has been considered one of the cardinal features of Cushing's syndrome. In a recent report (1), 31 of 33 such patients showed a diabetic glucose tolerance curve, although only five of these manifested frank diabetes. This incidence is in general agreement with the findings in 189 cases of Cushing's syndrome, culled from the literature and reviewed in the same article. It was originally thought that the use of ACTH and cortisone would similarly produce diabetes mellitus as one of the side effects of the induced hyperadrenalism. The iatrogenic disease, from reports in the literature (2, 3), however, occurs in less than one per cent of patients on therapeutic doses. Furthermore, almost all of these patients either had latent diabetes or a family history of diabetes. Because the rarity of frank diabetes with ACTH or cortisone therapy without such a

history has been emphasized recently by several authors (3-5), the following patient is presented.

CASE REPORT

A 34 year old negro man, who first had visual difficulties in 1944, was hospitalized in 1949 with bilateral uveitis and peribronchial lymph node enlargement. A lymph node from the left posterior cervical region showed only reaction hyperplasia. Following discharge, he continued to have visual difficulties mostly in the right eye. In addition, increasing shortness of breath on exertion was noted. The patient became blind in the right eye in 1952, and was admitted to the Veterans Administration Hospital, Perry Point, Maryland, in April 1954. A fasting blood glucose was 95 mgm. per cent, albumin 3.2 gm. per cent, globulin 5.4 gm. per cent, and sedimentation rate 34 mm. per hour. A roentgenogram of the chest showed marked infiltrations in both lower lung fields, more on the right. An intravenous pyelogram revealed bilateral intrinsic calcification. Histologic examination of a left femoral node demonstrated a granulomatous process compatible with sarcoidosis. The family history was negative for diabetes mellitus.

On transfer to the Fort Howard Veterans Adminis-

* From the Medical Service.

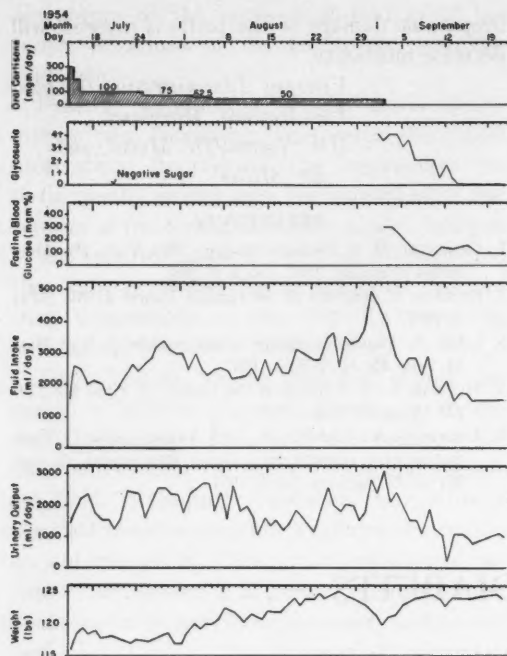


FIG. 1. Development of diabetes during cortisone therapy, with pertinent clinical and laboratory data.

tration Hospital in June 1954, the patient was well developed, poorly nourished, and chronically ill. Temperature was 98°F, the pulse 92 per minute, the respirations 20 per minute, and the blood pressure 130/90. A right phthisis bulbi and fibrinous strands binding the left pupil were present. Dullness with fine moist rales was found at both bases, more on the right. The second pulmonic sound was louder than the second aortic. The liver was barely palpable on inspiration. Marked clubbing and cyanosis of the fingernails and mild clubbing of the toenails were noted. There was enlargement of the axillary and inguinal lymph nodes bilaterally.

The hemoglobin was 11.6 gm. per cent, white blood cells 4100 per cmm., polymorphonuclear leukocytes 65 per cent and lymphocytes 35 per cent. The urine contained albumin (one plus), no sugar, along with five white blood cells and 20 red blood cells per high power field on microscopic examination. A roentgenogram of the chest showed perivascular infiltrations in both lower lung fields, with haziness in the right costophrenic angle, which was more marked than on the previous examination. An electrocardiogram showed flat and inverted T-waves.

Enucleation of the right eye was performed in June 1954, and histological examination was consistent with

sarcoidosis. Pulmonary function studies on July 13, 1954, were typical of pulmonary fibrosis with diffusion difficulties. The skin reaction to 0.005 mgm. PPD was negative. The patient was considered to have generalized sarcoidosis involving the eyes, lungs, heart, kidneys and lymph nodes. He was started on cortisone on July 14, 1954, with the dosage as indicated in figure 1. Urinalysis on July 21, 1954, was still negative for sugar. The patient showed marked subjective improvement with an eight pound weight gain and a decrease of the dyspnea on exertion. Serial roentgenograms of the chest showed marked improvement of the bilateral infiltrations, especially on the right. The T-wave abnormalities, on repeated electrocardiograms, returned towards the normal. Pulmonary function was improved on August 3, 1954. The patient felt well until August 28, 1954, when polydipsia, polyuria and weight loss appeared. On September 1, 1954, a routine examination showed three plus glycosuria, and on September 2, 1954, a fasting blood glucose was 309 mgm. per cent. He lost five pounds in weight during a one week period. Accordingly, the cortisone was discontinued on September 2, 1954, and a rapid decrease of the polydipsia, polyuria, and fasting blood glucose ensued. There was a more gradual disappearance of the glycosuria along with increase in his weight (figure 1). In periodic glucose tolerance tests a return of the curve to normal by October 6, 1954, was seen (figure 2). Resumption of cortisone therapy along with insulin was considered, but the patient's clinical improvement was sustained, and he was, therefore, discharged on December 2, 1954, to be followed at frequent intervals.

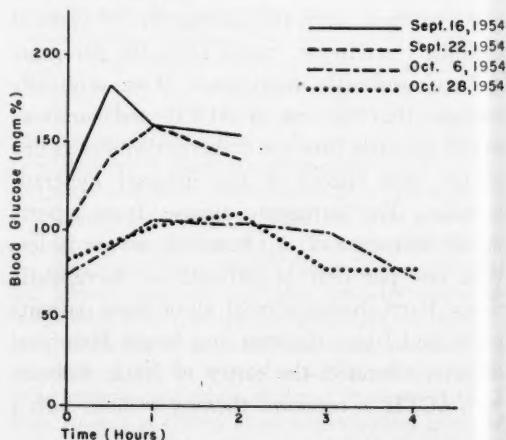


FIG. 2. Glucose tolerance tests after cortisone therapy (100 gm. glucose orally.)

COMMENT

While on cortisone therapy, a young negro man with generalized sarcoidosis developed manifestations of acute diabetes mellitus without acetonuria. The symptoms of the disease disappeared rapidly on cessation of cortisone, the hyperglycemia in four days, and the glycosuria in twelve days. The glucose tolerance curve remained abnormal for three weeks, but reverted to normal at five weeks. This patient, without any known family history of diabetes and without latent diabetes, acquired frank steroid diabetes on 50 mgm. of cortisone per day, after more than five weeks of therapy. Well over 100 patients have been treated with ACTH or cortisone at this hospital, but this is the only one falling into this category.

The effects of cortisone, as related to diabetes mellitus, stem from its actions on intermediary carbohydrate metabolism. The concept of stimulation of gluconeogenesis from protein was first advanced by Long and coworkers (6) as a result of their work on animals with adrenal insufficiency, who demonstrated an increase in urinary nitrogen and glycogen stores by cortisone administration. It was given further support by Welt et al. (7) who used C^{14} -labeled glucose infusions in cortisone-fed rats, with the rate of glucose formation from other sources increased seven-fold compared to the normals. The possible acceleration of gluconeogenesis from fat was suggested by Kinsell and his group (8) in experiments with individuals who were fasting or received a very high fat intake, whose ketonuria was eliminated by ACTH or cortisone. Further evidence was adduced by an increased degree of glycosuria in diabetic patients on a carbohydrate-free diet, who were given ACTH or cortisone. In addition, there has been accumulating evidence (6, 9-11) that cortisone must inhibit some phase of carbohydrate utilization by promoting deposition of glycogen, oxidation to carbon dioxide and water, or conversion to fat and protein. An action of cortisone, which requires differentiation, is the renal factor (12-14)

of the associated glycosuria, which has been reported to occur without any concomitant rise in blood glucose.

In normal rats, force-fed with a high carbohydrate diet, Ingle (15) was able to produce glycosuria with cortisone in the range of 5 mgm./day, and ketonuria (16) with doses of 10 mgm./day. As contrasted with pancreatic diabetes, the steroid diabetes thus produced showed insulin insensitivity, striking diminution of glycosuria with fasting, and a negative nitrogen balance. Conn and coworkers (17, 18) demonstrated glycosuria, mild increases in fasting blood glucose and abnormal glucose tolerance curves in four normal men treated with 100 to 150 mgm. ACTH per day, with a return to normal within two weeks of withdrawal. Baehr (19) described one out of 14 patients treated with ACTH who displayed diabetes, but there was a strong family history of diabetes. Sprague et al. (20) presented four out of 27 patients, given 100 to 200 mgm. of cortisone daily, who showed abnormal glucose tolerance curves; but, one had a history of diabetes, two had abnormal glucose tolerance curves after withdrawal, and no data is available on the fourth patient subsequent to therapy. Bookman and coworkers (2) noted five cases of steroid diabetes from over 500 humans taking ACTH or cortisone; but, of these, four had a family history of diabetes and the fifth had an episode of glycosuria prior to therapy and an abnormal glucose tolerance curve one year after therapy. Interestingly, only one of the five showed the diabetogenic effect with cortisone as well as ACTH, while the other four showed the effect with ACTH but not cortisone.

Boland (21) observed one of 76 persons on prolonged therapy with cortisone, with no family history of diabetes and a normal pre-treatment glucose tolerance curve, who developed a definite decrease in carbohydrate tolerance at the three-month period. Bunim and his group (14) detail a patient who was given courses of ACTH and cortisone over a one year period, which produced glycosuria, mild hyper-

glycemia and an abnormal glucose tolerance curve, when the dose reached 60 mgm. of cortisone or 20 mgm. of ACTH daily. Our patient evidently falls into the same rare category as those of Boland and Bunim, as compared to the more common, though still infrequent, individual with a family history of diabetes or with the latent disease. Acetonuria has never been reported with steroid therapy, even when frank diabetes has supervened.

In view of the frequency of diabetes in Cushing's syndrome and the demonstrated effects of ACTH and cortisone on carbohydrate metabolism, it might be interesting to consider the reasons for the marked rarity of steroid diabetes in normals, in addition to its more frequent occurrence with ACTH as compared to cortisone. Many observers (22, 23) consider the normal pancreatic islet reserves as the most important compensatory mechanism, with insulin secretion varying directly with adrenocortical activity. This idea may derive some support from patients without an islet reserve, namely, those with Addison's disease and diabetes, who develop very intense diabetogenic effects with cortisone. The decreased incidence of diabetes with cortisone, as compared to ACTH, may be explained by its suppression of ACTH elaboration, with resulting fall in endogenous adrenal hormone (24). Other factors that may enter are the comparative dosage of ACTH and cortisone, as well as the probable production of hydrocortisone and perhaps other adrenal hormones, rather than cortisone, by ACTH therapy. Extending the concept of a limited reserve of the pancreatic islets as the explanation for sustained hyperglycemia and glycosuria during ACTH or cortisone therapy, Thorn (25) feels that such individuals may possibly be considered to have latent diabetes. Berger (26) has described a new test for finding potentially diabetic persons by the use of 100 mgm. of ACTH prior to a glucose tolerance test. He noted increased blood sugar levels in siblings of

diabetic patients, but not in normals without a family history. If this concept is correct, then our patient would have to be considered as a potentially diabetic man although he shows no other evidence for it.

SUMMARY

Steroid diabetes occurs in less than one per cent of patients under therapy with ACTH or cortisone. It is almost always associated with latent diabetes or family susceptibility. Without such a history, its production is so rare, that a case report is presented. When it does occur, steroid diabetes is usually mild and reversible, and should be no bar to further therapy.

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BIBLIOGRAPHY

1. PLOTZ, C. M., KNOWLTON, A. I., AND RAGAN, C.: Natural history of Cushing's syndrome. *Am. J. Med.*, **13**: 597, 1952.
2. BOOKMAN, J. J., DRACHMAN, S. R., SCHAEFER, L. E., AND ADLERSBERG, D.: Steroid diabetes in man. *Diabetes*, **2**: 100, 1953.
3. FORSHAM, P. H.: Discussion, *Diabetes*, **2**: 110, 1953.
4. THORN, G. W. ET AL: Pharmacological aspects of adrenocortical steroids & ACTH in man. *N.E.J.M.*, **248**: 284, 1953.
5. BEASER, S. B.: Diabetes mellitus, *N.E.J.M.*, **251**: 698, 1954.
6. LONG, C. N. H., KATZIN, B. AND FRY, E. G.: Adrenal cortex and carbohydrate metabolism. *Endocrinology*, **26**: 309, 1940.
7. WELT, I. D., STETTEN, D., JR., INGLE, D. J., AND MORLEY, E. H.: Effect of cortisone upon rates of glucose production and oxidation in rat. *J. Biol. Chem.*, **197**: 57, 1952.
8. KINSELL, L. W., ET AL: Evidence for acceleration of neoglucogenesis from fat by ACTH, cortisone and related compounds. *J. Clin. Endocrinol. & Metab.*, **12**: 945, 1952.
9. RUSSELL, J. A.: The relationship of the anterior pituitary and the adrenal cortex in the metabolism of carbohydrate. *Am. J. Physiol.*, **128**: 552, 1940.
10. INGLE, D. J., AND THORN, G. W.: Comparison of effects of 11 desoxycorticosterone acetate and 17 hydroxy 11 dehydrocorticosterone in partially depancreatized rats. *Am. J. Physiol.*, **132**: 670, 1941.
11. INGLE, D. J.: Some studies on role of adrenal cortex in organic metabolism. *Ann. N. Y. Acad. Sc.*, **50**: 576, 1949.
12. CONN, J. W., LOUIS, L. H., AND JOHNSTON, M. W.: Ale-

- viation of experimental diabetes by administration of reduced glutathione. *Science*, **109**: 279, 1949.
13. KASS, E. H., INGBAR, S. H., AND FINLAND, M.: Renal glycosuria induced by ACTH. *Proc. Soc. Exp. Biol. & Med.*, **73**: 669, 1950.
 14. BUNIM, J. J., KALTMAN, A. J., AND McEWEN, C.: Diabetogenic effect of cortisone and ACTH in a non-diabetic patient with rheumatoid arthritis. *Am. J. Med.*, **12**: 125, 1952.
 15. INGLE, D. J.: The production of glycosuria in the normal rat by means of 17 hydroxy 11 dehydrocorticosterone. *Endocrinol.*, **29**: 649, 1941.
 16. INGLE, D. J., PRESTRUD, M. C., AND MEGAMIS, J. E.: Effects of administering large doses of cortisone to normal rats. *Am. J. Physiol.*, **166**: 171, 1951.
 17. CONN, J. W., LOUIS, L. H., AND WHEELER, C. E.: Production of temporary diabetes mellitus in man with ACTH. *J. Lab. & Clin. Med.*, **33**: 651, 1948.
 18. CONN, J. W., LOUIS, L. H., AND JOHNSTON, M. W.: Studies upon mechanisms involved in the induction with ACTH of temporary diabetes in man. *Proc. Am. Diab. Assoc.*, **8**: 215, 1948.
 19. BAEHR, G., ET AL.: Influence of cortisone and ACTH in lupus erythematosus. *Tr. A. Am. Phys.*, **63**: 89, 1950.
 20. SPRAGUE, R. G., ET AL.: Observations on the physiologic effects of cortisone and ACTH in man. *Arch. Int. Med.*, **86**: 199, 1950.
 21. BOLAND, E. W.: Prolonged uninterrupted cortisone therapy in rheumatoid arthritis. *Brit. M. J.*, **2**: 191, 1951.
 22. SPRAGUE, R. G., MASON, H. L., AND POWER, M. H.: Studies of the effects of adrenal cortical hormones on carbohydrate metabolism in normal subjects. *Proc. Am. Diab. Assoc.*, **9**: 149, 1949.
 23. WILSON, D. L., ET AL.: The functional relationship between the pancreatic islets and the adrenal cortex in man. *Proc. Am. Diab. Assoc.*, **10**: 25, 1950.
 24. THORN, G. W.: Discussion: Effects of adrenal cortical hormones. *Proc. Am. Diab. Assoc.*, **9**: 167, 1949.
 25. THORN, G. W., ET AL.: Pharmacological aspects of adrenocortical steroids and ACTH in man. *N.E.J.M.*, **248**: 632, 1953.
 26. BERGER, H.: Method of increasing sensitivity of glucose tolerance test. *J.A.M.A.*, **148**: 364, 1952.

BONE MARROW BIOPSY IN MILIARY TUBERCULOSIS

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The diagnosis of miliary tuberculosis has always presented a difficult problem to the clinician. Myers (1) has stated that 50 per cent or more of the diagnoses in the past have been possible only post mortem. Chapman and Whorton (2) found that only 25 per cent of the patients in their series had been diagnosed clinically. In 1945, Schleicher (3) outlined a new method of sternal marrow aspiration with histological examination of the sectioned particles for the diagnosis of miliary tuberculosis. Because of the good results with chemotherapy, it was felt that early diagnosis was essential, and could perhaps be more easily established by sternal marrow trephine to obtain tissue for biopsy. This procedure was used successfully in three patients suspected of having miliary tuberculosis.

* From the Medical Service.

CASE REPORTS

Case 1. A 25 year old negro man was admitted to the Medical Service in January, 1950, complaining of fever, headache, pain in the eyes and sore throat, of nine days' duration. He was acutely ill with an elevated temperature. The remainder of the physical examination was essentially normal. The red blood cell count was 3,700,000 per cmm., the hemoglobin 10.6 gm. per cent, the white blood cells 12,900 per cmm., of which 82 per cent were polymorphonuclear leukocytes and 18 per cent lymphocytes. The sedimentation rate was 24 mm. per hour (Cutler method). Numerous sputa and gastric washings were negative for acid-fast bacilli. A roentgenogram of the chest showed fine miliary infiltrations in both lung fields. A lymph node, resected for biopsy, was reported as normal. At the same time, a sternal marrow trephine was performed, and on histological examination the sections exhibited numerous caseous and non-caseous tubercles. The patient was placed on anti-tuberculous drug therapy. His condition remained unchanged, and he was removed from the

hospital by the family against medical advice on March 29, 1950.

He returned to the hospital on April 6, 1950, because of double vision and a stiff neck. He was confused, disoriented, and hallucinating. The temperature was 103°F., the optic discs possibly blurred, the neck definitely rigid, and Kernig's signs questionable. Lumbar puncture showed an initial spinal fluid pressure of 300 mm. of water, a cell count of 65 white blood cells per cmm. with 71 per cent polymorphonuclear leukocytes and 29 per cent lymphocytes. The patient was again placed on anti-tuberculous chemotherapy including intrathecal streptomycin, 50 mgm. daily for the first week. His sensorium gradually cleared. His temperature gradually returned to normal by September 1950. During the period of his hospitalization a tubercle formed in the choroid of his right eye, and subsequently healed. On November 2, 1950, a left-sided hemiparesis which was thought to be due to a tuberculoma of the brain was noted. In February 1951, a mass in the right testicle was found, and right epididymectomy and orchidectomy were performed. Histological examination demonstrated fibrocaceous tuberculosis of the testis and epididymis. Anti-tuberculous drug therapy was continued for two years. All active tuberculous foci apparently healed. Roentgenograms of the chest for more than a year prior to his discharge from the hospital were normal. The patient was left with marked reduction in vision due to an adhesive optico-chiasmatic arachnoiditis, and cerebral damage, with marked deficits in memory, judgment and orientation. He was on trial leave from the hospital from May 1, 1953 to October 22, 1953, at which time he was discharged under the care of a guardian.

COMMENT. This patient was admitted to the Medical Service, acutely ill, with a roentgenologic picture of military pulmonary tuberculosis. A definite diagnosis was established by bone marrow trephine and histological examination, at the same time that a lymph node, removed for biopsy, was found to be normal. While under treatment with anti-tuberculous drugs, he developed tuberculous meningitis, tubercles in the fundus of the eye, hemiparesis probably due to a tuberculoma, and tuberculous epididymitis and orchitis. Despite this succession of complications, he was eventually discharged from the hospital with inactive disseminated military tuberculosis.

Case 2. A 26 year old negro man was admitted to the Surgical Service on October 14, 1953, with a mass in the left wrist, which had first appeared nine months previously and had gradually increased in size. A large, nontender, right testicle, in addition to the four by three by three cm. mass in the left wrist was noted. The hemoglobin was 12.7 gm. per cent, the white blood cells 4900 per cmm., polymorphonuclear leukocytes 69 per cent, lymphocytes 30 per cent and monocytes 1 per cent. The sedimentation rate was 17 mm. per hour (Cutler method). The urine gave a three plus reaction for albumin. Many white and red blood cells per high power field were found on microscopic examination. Numerous sputa and gastric washings were negative for acid-fast bacilli. A roentgenogram of the chest revealed military densities throughout both lung fields. The skin reaction to 0.00002 mgm. PPD was positive. The patient was completely asymptomatic and afebrile. A sternal bone marrow trephine to obtain tissue for biopsy was performed on October 22, 1953. A histological diagnosis of military tuberculosis was made. The patient was started on streptomycin and sodium para-aminosalicylate on October 30, 1953. On November 2, 1953, right epididymectomy and orchidectomy were done, with a histological report of tuberculosis of the epididymis and testis. Isoniazid therapy was added on November 17, 1953. The mass in the left wrist gradually decreased in size, and disappeared after several months. Serial roentgenograms of the chest revealed almost complete clearing of the military densities within a few months.

COMMENT. This patient was first admitted to the Surgical Service because of the presenting complaint of mass in the left wrist, and was found to have the rare type of chronic military tuberculosis, "granulie froide," which diagnosis was not made until revealed by bone marrow biopsy.

Case 3. A 24 year old negro man was admitted to the Orthopedic Service on July 18, 1954, complaining of severe pain in the back, following a fall down a flight of stairs three days prior to admission. The temperature was 103.2°F. and the pulse 100 per minute. Tenderness was present over the second and third lumbar vertebrae and straight leg raising was limited to 45 degrees bilaterally. The red blood cells were 4,800,000 per cmm., hemoglobin 11.6 gm. per cent, white blood cells 3900 per cmm., polymorphonuclear leukocytes 56 per cent, lymphocytes 42 per cent, and eosinophils 2 per cent. Sedimentation rate was 22 mm. per hour (Cutler

method). The spinal fluid was entirely normal. Sputa and gastric aspirations were negative for acid-fast bacilli. Multiple agglutination tests and blood preparations for Lupus erythematosus cells were negative. Roentgenograms of the lumbar spine were normal. A roentgenogram of the chest on admission was normal. The skin reaction to 0.0002 mgm. PPD was negative, and to 0.005 mgm. PPD positive. Histoplasmin (1:1000) skin test was negative. The patient was acutely ill and ran a spiking fever to 104°F. daily. A roentgenogram of the chest on July 26, 1954, showed questionable miliary densities, which became definite on the film of July 29, 1954. He was placed on streptomycin, isoniazid and sodium para-aminosalicylate therapy on July 29, 1954. A sternal bone marrow trephine was performed on July 30, 1954. Histological examination revealed discrete and conglomerate tubercles with an acid-fast bacillus in a giant-cell. The temperature became normal after six weeks of chemotherapy. He has been asymptomatic since that time and has gained considerable weight. Serial roentgenograms of the chest showed marked clearing of the miliary densities.

COMMENT. This patient, incidentally admitted to the Orthopedic Service because of pain in the back as the result of a fall, shortly after admission presented the differential diagnostic problem of fever of unknown etiology. Among other diagnoses, acute miliary tuberculosis was considered. Repeated roentgenograms of the chest finally showed miliary densities, and the diagnosis was definitely confirmed by bone marrow biopsy.

DISCUSSION

The above three patients illustrate the difficulty in arriving at an early diagnosis of miliary tuberculosis. The history and physical examination are of little practical aid. The blood picture, which frequently shows leukopenia with neutrophilia, is of minor diagnostic value. A positive tuberculin test is suggestive only in infants and in recently negative reactors, but is rarely of practical importance. The clinical course is too varied to be characteristic of the disease. The roentgenograms of the chest are helpful when they show typical miliary densities. These are present, however, in only 50 per cent of the

patients even late in the disease (4), and when they do appear, must be differentiated from other conditions that give miliary-type infiltrations. Ophthalmoscopic examination frequently reveals miliary tubercles in the choroid (5, 6), but has not been used frequently as a means of diagnosis (2).

Chapman and Whorton (2), in their clinicopathological study of 63 cases of tuberculosis diagnosed at autopsy, found tubercles in the bone marrow in 84 per cent, next in incidence only to the liver and spleen. Schleicher (3), who devised the method of histological examination of aspirated sternal marrow, later reported eight cases diagnosed by this method (7). Armstrong and coworkers (8), using Schleicher's method, demonstrated miliary tubercles in the bone marrow in 16 of 20 patients suspected of having miliary tuberculosis, while 125 controls with active non-miliary tuberculosis showed no tubercles by this technic. Petrakis (9), in 1951, reported a patient with miliary tuberculosis without roentgenological or clinical findings, in whom the diagnosis was made by the same method, and the course followed by serial examinations. He was treated with dihydrostreptomycin, and showed rapid improvement with disappearance of tubercles from the bone marrow in 17 days.

In view of these findings, it is surprising that this method of diagnosis in miliary tuberculosis has been so generally neglected. With the advent of excellent results from prolonged chemotherapy, the early diagnosis of miliary tuberculosis becomes of utmost importance.

SUMMARY

1. The diagnosis in three patients suspected of having miliary tuberculosis was established by bone marrow trephine with histological examination.

2. Autopsy studies reported in the literature show a very high incidence of bone marrow involvement in miliary tuberculosis.

3. It is recommended that histological examination of bone marrow be performed in all patients suspected of having military tuberculosis.

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BIBLIOGRAPHY

1. MYERS, J. A.: Dramatic advances on the tuberculosis front. *Journal-Lancet*, **65**: 160, 1945.
2. CHAPMAN, C. B., AND WHORTON, C. M.: Acute generalized military tuberculosis in adults. *N.E.J.M.*, **235**: 239, 1946.
3. SCHLEICHER, E. M.: Pernicious anemia and military tuberculosis of bone marrow organ. *Am. J. Clin. Path.* **15**: 402, 1945.
4. MYERS, J. A.: The chest and the heart. Charles C. Thomas, Springfield, Illinois, 1948, p. 892.
5. LITTEN, M.: Über akute miliartuberkulose. *Klin. Vorrage (Volkman)*, **119**: 1061, 1875.
6. DEBRE, R.: Military tuberculosis in children. *The Lancet*, **2**: 545, 1952.
7. SCHLEICHER, E. M.: Military tuberculosis of the bone marrow. *Amer. Rev. of Tuberculosis*, **53**: 115, 1946.
8. ARMSTRONG, A. R., ANDERSON, W., AND LEE, J. H.: Sternal marrow aspiration in military tuberculosis. *Canad. M.A.J.*, **65**: 468, 1951.
9. PETRAKIS, N. L.: Resolution of military tuberculosis of bone marrow with dihydrostreptomycin therapy. *A.M.A. Arch. Int. Med.*, **87**: 594, 1951.

PHYSICAL MEDICINE AND REHABILITATION IN HEMIPLEGIA

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Apoplexy or a "stroke" ranks third as a cause of death. Because the mortality rate is high and the survival leaves a person in a very severely disabled state, the syndrome of stroke has inspired fear in the layman and physician alike.

The most common functional residual of "a stroke" is a hemiplegia. The hopelessness and fatalism towards hemiplegia has been partially dissipated in recent years, by developments in the field of Physical Medicine and Rehabilitation (1). Gone is the time when the treatment of recently acquired hemiplegia consisted of little more than rest in bed, an ice pack to the head, and sedation. Physical inactivity has been considered nature's attempt to "ground" the patient but the philosophy that activity is not

good for such patients is also a matter of the past. Optimism in the prognosis for the patient is justified because almost every one so affected can be rehabilitated to walk and many can regain partial use of the affected upper extremity. Nevertheless, the rehabilitation of the patient with hemiplegia is not a simple procedure which may be accomplished in any home by the physician, nurse, member of family, and patient. Patients with mild degrees of hemiplegia may become ambulant and may even hold a job through their own volition and effort and a little aid from a physician. Patients, however, with more severe types of hemiplegia can only be rehabilitated in a department of Physical Medicine and Rehabilitation by a physician trained in this field and supported by competent physical therapists.

This opinion is based on personal experience in the rehabilitation of over 200 patients with hemiplegia in the Physical Medicine and Rehabilitation Service of the Veterans Administration Hospital at Fort Howard during the past five years. Successful rehabilitation was achieved

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not only of the patients with noncomplicated hemiplegia, but even those with orthopedic, arthritic, and other complications which existed prior to the onset of the hemiplegia.

It is the object of this paper to outline the methods and procedures used by us in managing these patients. In general, the sooner physical medicine and rehabilitation procedures are instituted, the better will be the results.

Treatment in the physical therapy clinic is usually started several days after the onset of hemiplegia due to embolism and thrombosis. In patients with cerebral hemorrhage, however, where the blood pressure is elevated and varying degrees of mental confusion exist, physical medicine and rehabilitation procedures are confined to bed activities for approximately 3 to 4 weeks.

PHYSICAL THERAPY IN BED

Physical Medicine and Rehabilitation measures in all types of hemiplegia start while the patient is still in bed. They consist of: (a) heat to the affected parts, using an infra-red lamp for about 15-20 minutes followed by (b) passive motion through the normal range of joint motion, two or three times daily.

When the patient has had a cerebral hemorrhage or any other condition which will confine him to bed for a longer time, additional measures to prevent contractures and deformities are necessary: (a) a pillow may be put in the axilla to prevent adduction contractures of the arm. Don't put a pillow under the knee as this will lead to shortening of the hamstring muscles and a flexion deformity of the knee joint which will cause trouble in ambulation later; (b) passive exercise is given to the affected upper extremity through a pulley fixed to the head of the bed, as shown in figure 1; (c) a foot board is provided or preferably a foot-drop splint with a tension spring of elastic webbing acting as a spring, to prevent a foot-drop and contracture of the gastrocnemius group of muscles. This splint permits exercise of the flexors and extensors of

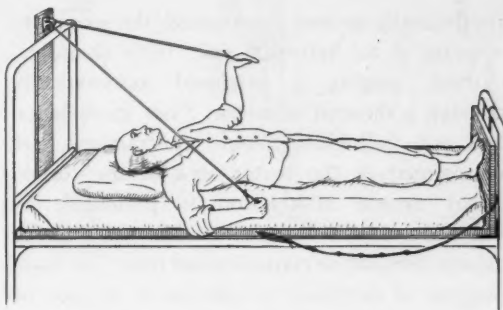


FIG. 1

the ankle joint when a certain degree of active motion is present in the leg muscles; (d) when the patient is able to sit in bed, a knotted rope is tied to the foot of the bed. The patient grasps the rope with his good hand and with the aid of the affected hand, if there is some active motion present there, he pulls himself up to a sitting position (figure 1).

PHYSICAL THERAPY IN A CLINIC

After the patient is strong enough to sit out of bed for a couple hours daily, he is sent to the physical therapy clinic where the following examinations and treatment are carried out: (a) *muscle examination*—to determine the degree and extent of active motion present in the hip flexors, knee extensors, and dorsi-flexors and evertors of the ankle. The results of the tests are used in planning for the patient's training in ambulation, if resistive exercises are necessary and the degree and type of bracing which will be required to permit walking; (b) *heat*—infra-red radiation to the upper and lower extremities; (c) *electrical stimulation*—to wrist and finger extensors, quadriceps, and dorsiflexors and evertors of the ankle. Faradic and sinusoidal currents are used to produce a tetanic contraction. Since normal muscle contraction is a summation of stimuli a tetanizing current reproduces most closely the normal muscle contraction. To produce contraction and relaxation the current has to be surged. The surging of a faradic current is produced by hand, by sliding

rhythmically an iron core through the secondary winding of an induction coil. With sinusoidal current, surging is produced automatically through a rheostat or motor. Since movements, and not individual muscle contractions, are represented in the motor area of the cortex, group muscle stimulation is preferable to individual muscle stimulation. Moreover, group muscle stimulation consumes less time. The main purpose of electrical stimulation is to prevent edema. The exact reason why edema develops in some patients with an upper motor neuron paralysis is not understood. Primarily, edema is the result of absence of muscle contraction which causes lymphatic and venous stasis. If the edema is absorbed, the patient may wear shoes and braces to better advantage. Braces worn over the edematous extremities produce ulcerations from pressure and it takes months before these heal. When active motion begins to return but the patient is unable as yet to lift the part against gravity, electrical stimulation aids in active and re-educational exercise. The patient is instructed to synchronize his volitional efforts of movement with the artificial contractions produced by the tetanizing current. Some patients are unable to move the affected extremity even though the motor cells of the cortex have recovered sufficiently to permit some degree of motion. This may be the result of a mental block from repeated failure to move the part actively. When the patient sees the part move through electrical stimulation he attempts to move the part and takes advantage of the increased functional capacity of the motor cortex; (d) when the patient is able to use the part against gravity, *re-educational* and manual resistance exercises are given.

CORRECTIVE THERAPY

When the patient has made sufficient progress in physical therapy he is taken to corrective therapy, where the following procedures are carried out: (a) Balancing in parallel bars and final determination of the extent and type of

bracing necessary; (b) gait training in parallel bars; (c) out of parallel bars with a cane in the good hand. For those who fear falling or are unsteady, a crutch under the good arm is used. (d) Training and practice in sitting in a chair with arms, without arms, and negotiation of steps and curbs; and (e) progressive resistance exercises to strengthen normal and affected extremities.

OCCUPATIONAL THERAPY

From corrective therapy the patient is taken to occupational therapy for activities which aim at (a) improvement of coordinated movements of the upper extremity, especially of the hand; (b) to teach the patient activities of daily living compatible with his disability. He undertakes personal care, such as dressing, shaving, feeding, opening doors, using the telephone, and writing. The cardinal rule is "to work with the patient and not for the patient." He must be encouraged to do things for himself, regardless of how clumsy he may appear in the process.

BRACES IN HEMIPLEGIA

No matter how severe the hemiplegia may be, every patient can be rehabilitated to walk provided he has a clear sensorium and has the will to do so. In many, bracing is essential. The amount and type of bracing will depend on the degree of paralysis which can be assessed in most patients following the initial muscle examination and a trial at ambulation in parallel bars. Left to his own powers, the typical patient walks with an extended knee and circumducts his extremity in placing the foot in a forward position. The circumduction gait is used because flexion of the hip and knee put the foot automatically in plantar flexion and inversion. Since he is afraid to have his foot "buckle under" and fall, he soon learns that for security in walking he must keep the knee extended. The circumduction gait is inefficient and laborious, and once it becomes established, a correction becomes difficult.

A short leg, double bar brace, with a foot drop attachment, and a 90 degree stop stabilizes the ankle (figure 2a). In some patients with a severe paralysis of the dorsiflexors and evertors of the ankle, a Y strap attached to the lateral side of the shoe and medial bar of the brace is necessary. Putting the weight of the body on the heel tenses the spring which is adjustable for degree of tension. When the weight is shifted to the nonaffected foot, the spring automatically dorsiflexes the involved foot. With this brace the patient can flex the hip and the knee without affecting plantar flexion and inversion of the foot, and is able to normalize his walking.

When the quadriceps muscles are completely paralyzed, a knee lock and a Swiss U bar is used (figure 2b). When the patient sits, he presses against the chair with the U bar. This opens the knee lock and allows him to sit and flex the knee. The Swiss lock eliminates the necessity of manipulating a ring lock with the good hand, which usually is holding a cane or a crutch.

If the quadriceps muscles are weak, a long leg brace with a free lock and a mechanical device which simulates the action of the quadriceps muscles (2) is used (figure 2c). This device, which consists of two springs attached to the lateral bars of a long-leg brace with a free knee joint, produces a constant tension forward to extend the knee from a flexed position and keep it extended. The power and tension of the spring has to be overcome in sitting by the hamstrings. The contractile power of the hamstring muscles is measured with a special gauge in pounds. The pull of the springs has to be less than one-half of the power of the hamstring muscles also measured in pounds.

THE PATIENT WITH "OLD" HEMIPLEGIA

In a patient with hemiplegia who did not receive physical medicine and rehabilitation management, the flexors of the knee, the plantar flexors of the ankle, the adductors of the arm, the flexors of the elbow, the pronators of the forearm,

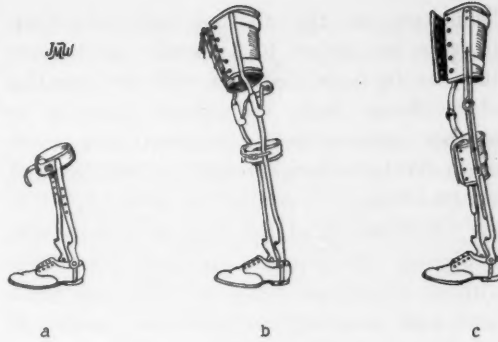


FIG. 2

and the flexors of the wrist, fingers and thumb, contract and produce typical flexion deformities. These patients do not have active motion in the affected extremities. It is surprising that, when these contractures are overcome by special tension braces (3), turnbuckle devices (4) and passive motion, a fair amount of active motion is present. Many patients can be rehabilitated to use the affected upper and lower extremity, even after 5 years of hemiplegia. The reason for improvement when the contractures have been corrected by tension or turnbuckle devices and passive motion, is because with the passage of time, a slow improvement in the motor ability of the cortex due to partial resolution of the lesion, occurs. Unfortunately, organic improvement of brain tissue cannot be translated into purposeful volitional movements, since the muscles and joints of the upper and lower extremities have become fixed. With the passage of time, the brain lesion improves, but during the same period the muscles, tendons, and joints deteriorate. When the flexion contractures are overcome, the patients are rehabilitated as outlined previously.

REHABILITATION OF THE PATIENT WITH HEMIPLEGIA AND ORTHOPEDIC DISABILITIES

Some patients who are permanently crippled by orthopedic disabilities, such as amputation and malposition of healed fractures, may have a

hemiplegia on the affected side (6). These patients are shifted to a chronic ward where they become bedridden often with the formation of decubitus. Some intercurrent infection or another cerebrovascular accident may cause death. At the Veterans Hospital at Fort Howard, a marked degree of success has been attained in the rehabilitation of this type of patient with hemiplegia. The first case on record of a patient with an amputation below the knee who had a hemiplegia involving the remaining portion of the lower extremity and also the upper extremity, and was rehabilitated for ambulation and activities of daily living was reported by Rudin, Levine, and Cronin (5).

The orthopedic phase is corrected first. A proper prosthesis or splint for the amputation or

a brace for the correction of adduction contractures or malposition is provided. The patient is rehabilitated in the same manner as any other with hemiplegia.

REHABILITATION OF THE PATIENT WITH HEMIPLEGIA AT HOME

The bed can be arranged as shown in figure 1. Braces are applied as in figure 2. For stability in ambulation training, a heavy kitchen chair is used (figure 3). The patient grasps the chair with the good hand and slides it along the floor. When progress is made, the chair is discarded and a crutch is used under the good arm. Later the crutch is discarded in favor of a cane.

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REFERENCES

1. RUDIN, L. N.: New horizons for the hemiplegia, *Cur. Med. Dig.* **19**: (Feb.) 1952.
2. RUDIN, L. N. AND CRONIN, D. J.: A mechanical quadriceps. *Arch. Phys. Med. and Rehab.* **33**: 15, (Jan.) 1952.
3. RUDIN, L. N.; CRONIN, D. J., AND CROUCHER, J. S.: Corrective brace for the upper extremity in hemiplegia, *J.A.M.A.* p. 479, (Oct.) 1953.
4. RUDIN, L. N. AND CRONIN, D. J.: Physical medicine in flexion deformity of the knee joint, *Arch. Phys. Med. and Rehab.* **32**: 729, (Nov.) 1951.
5. RUDIN, L. N.; LEVINE, L.; HAYES, E. R.; AND CRONIN, D. J.: Rehabilitation of the hemiplegic with orthopedic disabilities, *Occp. Therap. and Rehab.* **30**: (Feb.) 1951.
6. PASNIAK, A. O.; LONG, C.; DASCO, M. M., AND RUSK, H. A.: Rehabilitation of the hemiplegic amputee, *J.A.M.A.* p. 1463, (Aug. 21) 1954.

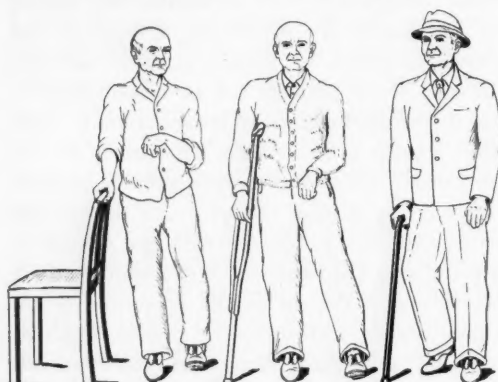


FIG. 3

PLANNING FOR THE PATIENT'S DISCHARGE

HELEN STUDZ*

At this hospital the medical program is not only arranged to aid patients to obtain the maximum degree of health possible, but it considers the patient's total needs including the period following hospitalization. It is the purpose of this paper to set forth the procedure used in

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planning for care after discharge. The plan may start at the time of admission when the family comes in with the patient and is available for discussion with the social worker and the Admitting Physician. In this way, the family, knowing what to expect, is immediately oriented to the fact that, through Social Service, as-

sistance will be available in planning for satisfactory care of the veteran on discharge. Early planning permits reduction in the number of hospital days and the cost of care.

The social worker, being an integrated part of the medical team, attends rounds on the medical service. In addition to helping the patient work through his social, economic and emotional problems during hospitalization, the social worker is concerned with medical follow-up in clinics or by private doctors, whenever financially possible, aiding the family in arranging for the patient's care in a nursing home or referral to community resources for financial help, vocational rehabilitation, job finding or other related assistance.

The procedure used by the social worker is outlined as follows. The patient is interviewed to insure that he understands the medical recommendations and to determine his preference regarding the plan to be made before discharge. If the patient is unable to give any information, the social worker contacts the family or, if necessary, friends. The patient's medical situation, obtained from the physician, and the nursing care he requires, as outlined by the nurse, are reviewed with the family. If the patient is to return to his home to be cared for by a member of the family, the social worker discusses community resources, including the Instructive Visiting Nurse Association. The Baltimore Regional Office of the Veterans Administration may be called upon to make a home evaluation needed in discharge planning. If nursing home care is required, this is discussed with the patient, and the family is given a list of nursing homes licensed by the State Health Department. Permission of the patient is obtained to release medical information to the nursing home. The family contacts, selects a nursing home, and makes necessary arrangements. They advise the social worker who informs the physician. If necessary, transportation by the Veterans Administration is arranged.

In conjunction with discharge plans for

patients with prolonged illnesses who return to their homes, the following illustrates what can be done:

A Spanish-American War veteran, who had had both legs amputated and who had a paralysis of his right arm, was subject to convulsions due to two cerebrovascular accidents. He could not talk and was occasionally incontinent. The patient wished to return home although the amount of nursing needed was considerable. His wife, who was younger and willing to cooperate in this plan, wished to have the patient at home. Their only income was a Spanish-American War Pension. Conferences between the doctor, the social worker and the wife of the patient were held to examine completely the needs of the patient at home and the resources which could be provided to meet these needs by the Veterans Administration and the community. Included in these arrangements were the issuance of a wheel chair at this hospital, provision of a hospital bed for the home by the Baltimore Regional Office, aid to the wife by a Visiting Nurse and authorization for the family doctor to care for the patient in his home on a fee basis. In addition, the hospital Steering Committee, after reviewing the situation, made arrangements for volunteers to visit the home to relieve the wife in her attendance on the patient for shopping, marketing and diversion.

The following procedural outline is intended as a guide in understanding the organized team approach by the full-time staff of this hospital and volunteers of the community in an effort to obtain the maximum rehabilitation of the hospitalized veteran. Three committees aid in this accomplishment:

- I. The Advisory Committee, comprised of the Chiefs of Services, is concerned with the total planning for the care of patients with long-term illnesses. This professional group formulates policy governing such care. The Committee meets whenever indicated.
- II. The Functional Committee, made up of representatives of all Services directly concerned with specific patients, considers treatment, motivation, rehabilitation potential and discharge difficulties. The chairman is the Chief of Professional Services. Meetings, held at intervals of a week,

usually last an hour or less. They effect a better inter-professional understanding of the medical, social and economic aspects of the patient. This Committee formulates a concerted plan for continuous medical service, if indicated, and assignment of responsibility for follow-up after discharge.

- III. The Steering Committee includes representatives of the volunteer organizations and the Chief of Special Services. This group

aids the patient to bridge the gap from hospital to community living.

This planning expedites the return of the veteran to community life more rapidly and decreases the cost of hospital care and the number of days of hospitalization per patient. Satisfactory planning prevents frequent readmissions of the patient to the hospital.

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PARASITIC DISEASES AT THE VETERANS HOSPITAL, FORT HOWARD, MARYLAND FROM 1947 THROUGH 1954

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During the past eight years 2.3 per cent of the patients admitted to this general hospital of 491 beds were infested with parasites. The incidence of identified infestation was, no doubt, less than the true incidence because specimens from only 22.1 per cent of the patients were examined for parasites. Approximately 98 per cent of the veterans admitted in this period were residents of Maryland. For this reason a review of the findings of a study of the parasitic infestations might be of interest to the practitioners of medicine in Maryland.

A brief but complete description of the tests which were employed by the study are presented. In this way the results of the survey can be more accurately evaluated and compared with the results of the pertinent surveys included in table 4. The meaning of the various data derived from this and the comparable studies is discussed. Certain pathologic findings are emphasized because they have value in clinical diagnosis. The advisability of including instruction in hygiene in therapy is stressed.

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² Pathologist.

DIAGNOSTIC PROCEDURES

Although parasitic infestations were suspected by clinical findings and the presence of an eosinophilia, the diagnosis was established only when the parasite was demonstrated. This group of procedures, complete for the diagnosis of parasitic diseases, is recommended to the physicians who practice, or intend to practice, among such patients. None of the tests requires elaborate equipment. All can be performed readily providing a bench, microscope, incubator, refrigerator, small autoclave and accessory supplies are available.

The specimens consisted largely of small portions of stools. A small group consisted of smears of blood, anal swabbings, proctoscopic tissues, aspirated fluids, duodenal-drainage fluid and tissues removed during operation and autopsy.

Practically any form of stool, whether it was contaminated with barium, or obtained from patients with diarrhea, or given cathartics, oily laxatives and enemas, was accepted for examination. Stools contaminated with urine and soapy enemas were unacceptable, however,

because the protozoa, which were unprotected by special membranes as were the ova, were lysed quickly. Flecks of mucus, blood and tissue were selected for examination when present. All specimens were refrigerated unless examined soon after arrival in the laboratory. No specimen was maintained in a warmed state in order to prevent the acceleration, thereby, of death and lysis, especially, of the protozoa.

Specimens were examined by one or more of the following methods: (1) wet preparations of fresh specimens in normal saline, (2) iodine stains of wet preparations, (3) fixed smears stained with iron-hematoxylin, (4) flotation by concentrated zinc sulfate solution, (5) sedimentation in a mixture of acid and ether, (6) culture of *Endamoeba histolytica* on artificial media, (7) digestion of tissue by potassium hydroxide, and (8) stains of thick and thin smears of blood by the Wright, Giemsa and Field stains. Cytological examinations of stools for differentiation of the dysenteries were done seldom. For this procedure reference is made to the Atlas by Ash and Spitz (1945; p. 103).

The anal swab technique was used occasionally and always when infestation by *Enterobius vermicularis* was suspected. The swabs were prepared by the NIH (27; 48) method. Glass rods were affixed to the small end of a rubber stopper and on the other end of the rod a small amount of cellophane was held in place by a rubber band (cut segment of hematological-pipette tubing). The rod and stopper were placed in a 150-mm. test tube. Swabbing of the anal mucosa was thorough. The material collected in the folds of the cellophane above the rubber band was examined by wet preparations and stained smears.

1. Wet Preparations. This was the routine parasitological examination. The other methods were employed if the examination of wet preparations was negative, confirmatory studies were needed and special tests were indicated.

A drop of a fluid specimen or fluid sediment, or a selected portion of a solid specimen, was mixed with a drop of normal saline on a slide,

overlaid with a cover slip, and examined through a microscope. Small fragments of mucosa, such as were obtained at the time of proctoscopic examination, were examined after being pressed thinly in a wet preparation.

2. Iodine Stain of Wet Preparations. Staining by iodine was particularly effective in the identification of cysts and flagellates. The staining was accomplished by adding a drop of Lugol's solution (iodine 2% and potassium iodide 4% in distilled water) to a wet preparation before the cover slip was mounted.

3. Iron-hematoxylin Stain. A means of critical differentiation between members of a species and exact identification of the less readily recognizable parasites was provided by this cytological stain. It had a further advantage of furnishing a permanent record of the diagnosis. The iron-hematoxylin stain was applicable especially in the identification of intestinal protozoa.

(1) Prepare a thin smear directly or from a wet mixture. Smears of material containing little protein are dried and immediately fixed whereas smears of material rich in protein are fixed before they dry. Slides are fixed 2 minutes at 60°C. in Schaudin's fixative (mix before use 20 ml. of a saturated aqueous solution of mercuric chloride, 10 ml. of 95% ethyl alcohol, and 1.5 ml. of glacial acetic acid; good for 12 hours).

(2) Wash smears in 70% alcohol. Remove mercuric crystals by placing slides for 1 minute in a solution of 0.5% iodine in 70% alcohol and then washing in running tap water for 5 minutes.

(3) Mordant smears for 2 minutes in 2% iron alum at 37°C. (The iron alum is placed in a coplin jar and brought to 37°C. in a water bath or incubator.) Wash slides in running tap water for 10 minutes.

(4) Stain smears in 0.5% aqueous hematoxylin for 2 minutes. Wash in running tap water for 10 minutes.

(5) Differentiate stains in 2% aqueous iron alum at room temperature until the desired degree of staining is attained. Wash in running

tap water for 10 minutes. (No counterstain is used.)

(6) Carry slides through 70%, 95%, and absolute alcohols, xylol, add mounting fluid and overlay a cover slip.

4. Zinc Sulfate Concentration—Flotation. The high specific gravity of the concentrated zinc sulfate (*granular*, U.S.P.) solution was highly effective in floating cysts, ova and *Strongyloides* larvae. It was the most successful method for the demonstration of cysts of *E. histolytica*.

A desired amount of stool or other specimen was gathered on a glass rod, or pipetted, and was thoroughly mixed in a 20-ml. test tube with 10 ml. of a 33% aqueous solution of zinc sulfate (sp. gr. 1.18). The test tube was then centrifuged for 3 minutes at 2,000 r.p.m. Approximately four loopfuls of surface fluid nearest the wall of the test tube were removed by a 5-mm. bacteriological loop and placed on a slide. One drop of Lugol's solution (see method No. 2) was mixed with the fluid and a cover slip was mounted.

5. Acid-Ether Centrifugation. The acid-ether combination was less damaging to ova, especially the *Schistosoma* ova. It was the method of choice, therefore, for searching for *Schistosoma* ova. It was used generally in the same manner as the zinc sulfate flotation method (No. 4).

Approximately 1 gram of stool was mixed thoroughly with 5 ml. of 40% hydrochloric acid (40 ml. conc. HCl plus 60 ml. distilled water) in a test tube. The mixture was then filtered through 2 layers of moistened bandage gauze in a 50-ml. funnel into a 15-ml. centrifuge tube. An equal quantity of ethyl ether was added. The test tube was tightly stoppered (rubber stopper or gloved finger) and shaken vigorously for 10 seconds. It was then centrifuged for 5 minutes at 1,500 r.p.m. The material at the acid-ether boundary was loosened. After settling the fluid was decanted. The specimen was resuspended in the small amount of residual fluid and a "wet" preparation was made.

6. Culture of *E. histolytica*. Cultures of speci-

mens for *E. histolytica* were occasionally positive when other methods failed to reveal the presence of the parasite. In all instances the cultures were positive 24 hours after inoculation. Beyond 48 hours of incubation the trophozoites were usually killed and lysed by the overgrowth of concomitant bacteria in the culture. Examination for trophozoites was made by removing a drop of fluid from the stirred bottom of the serum because the trophozoites settled to this location. The method was simple, actually, and it was highly valued. Nearly all specimens of exudate were cultured for *E. histolytica*.

(1) Aliquots of dehydrated endamoeba culture medium (Difco No. B53) are dissolved and autoclaved as directed.

(2) Approximately 5 ml. of sterile media are placed in a 20-ml. test tube and a slant from 1.0 cm. to 1.5 cm. long is prepared. The slant is covered with diluted sterile human serum (1 part serum; 9 parts saline). Add a loopful of sterile rice powder to the serum before inoculation of a loopful of specimen. Incubate at 37°C.

(Prepared sterile slants and sterile rice powder are obtainable from suppliers of dehydrated media.)

7. Potassium hydroxide Digestion. This method was employed in searching for *Schistosoma* ova and trichina larvae in tissue.

Specimens of tissue were placed in a 10-ml. test tube containing 5 ml. of 3 per cent potassium hydroxide. The tissue was digested at 37°C. for 30 minutes. A small quantity of the sediment was examined under a cover slip. (In case the specimen was a small piece of soft tissue, such as, mucosa, a more effective search for ova and larvae was offered by preparing a wet specimen—see method No. 1.)

8. Stains of Dried Blood Smears. Thin smears were made by backing up the edge of a tilted slide to a small drop of blood placed on one end of a thoroughly clean slide. After the blood had spread along the edge of the slide it was pushed quickly to the other end. Thick

smears were made by placing a drop of finger-prick or oxalated blood approximately 5 mms. in diameter on a thoroughly clean slide, and spreading to a diameter of approximately 2 cm. by an enlarging-circle movement of the corner of a clean slide.

Thin smears were dried preferably for a minimum of 30 minutes before staining. The optimum period of drying was 16 to 24 hours. Thick smears were stained within 30 minutes, however, in order to lake the blood, since the blood resisted laking by progressive fixation in air.

Preparations of the Wright and Giemsa stains were made according to methods devised by Smetana and Oktavec (1954). The stains prepared in this manner were uniformly excellent.

Preparation of the Wright Stain. Pour 15 ml. of glycerin and 250 ml. of absolute methyl alcohol into a laboratory blender. Add 0.4 gm. KH_2PO_4 , anhydrous, C.P. and 0.6 gm. Na_2HPO_4 , anhydrous, C.P., to the mixture and blend at approximately 8,000 r.p.m. for 5 minutes. Add 250 ml. of absolute methyl alcohol and 1.5 gm. Wright's powder (Coleman and Bell) and blend at the same speed for 10 minutes. Pour stain in a brown bottle and store in the dark to protect it from deterioration by sunlight. The stain requires no aging or filtering before use.

Preparation of the Giemsa Stain. Pour 33 ml. of glycerin in a laboratory blender, add 0.5 gm. of Giemsa powder (National Aniline), mix in blender at approximately 8,000 r.p.m. for 5 minutes. Then add 33 ml. of absolute methyl alcohol and blend at the same speed for 10 minutes. Pour the stock stain in a brown bottle and store in the dark to protect it from deterioration by sunlight. The stain requires no aging or filtering before use.

Preparation of the Field Stain. Solution A is prepared by dissolving 5.0 gm. of Na_2HPO_4 , anhydrous, C.P. and 6.25 gm. KH_2PO_4 , anhydrous, C.P. in 500 ml. of distilled water and then, after the buffer salts are completely dissolved, 0.8 gm. of methylene blue and 0.5 gm.

Azure II are added and dissolved. The stain is ready to use after standing 24 hours and filtering. It is useful for many weeks.

Solution B is prepared exactly like Solution A except that 1.0 gm. of eosin Y is used instead of the two dyes of Solution A. Solution B deteriorates slowly with use owing to gradual contamination by the carry-over of the basic dyes in Solution A.

Staining Procedures:

A. Wright Staining.

Flood smear with undiluted stain. After 1-2 minutes dilute with an approximately equal amount of distilled water and stain an additional 2 minutes. Wash stained smears with distilled water, drain and dry.

B. Giemsa Staining.

1. Thin smears: Prepare a working solution by adding 1 part of stain to 10 parts of distilled water. Fix with absolute methyl alcohol by flooding the slide and allowing the alcohol to evaporate (5-10 minutes) or fix 10 minutes by immersion. After slide is dry flood with working solution and stain for approximately 25 minutes. Wash well with distilled water, drain, and air dry.

2. Thick smears: Prepare a working solution by adding 0.6 ml. Giemsa stock stain to 20 ml. of buffer made by dissolving 2.56 gm. of Na_2HPO_4 , anhydrous, C.P., and 6.63 gm. of KH_2PO_4 , anhydrous, C.P., in distilled water to a volume of 1000 ml. (pH 6.4).

Flood slide with working solution and stain for approximately 18 minutes. Drain off stain. Do not wash. Dry at room temperature (Do not blot or heat).

C. Field Staining.

1. Dip slide for 1 second in Solution A.

2. Wash before drying by dipping several times in distilled water or until stain no longer is contained in the run-off water; drain well but do not allow slide to dry.

3. Dip slide for 1 second in Solution B.

4. Wash by dipping several times in distilled water. Drain and air dry.

TABLE 1
Incidence of Parasitic Infestation, 1947-1954

Year	Number of Admissions	Number of Stool Examinations	Number of Patients with Stool Examinations	Number of Patients Infested	Per Cent of Admitted Patients Infested	Per Cent of Examined Patients Infested	Number of Patients Examined for Malaria	Number of Patients with Malaria
1947	3720	2045	682	78	2.1	11.4	155	25
1948	3837	1677	559	53	1.4	9.5	70	13
1949	4102	2331	777	101	2.5	13.0	44	0
1950	3983	3744	1248	132	3.3	10.6	18	0
1951	3519	2345	782	78	2.2	10.0	14	5
1952	3868	2660	887	121	3.1	13.6	38	25
1953	3734	2975	992	70	1.9	7.1	20	6
1954	3566	2177	773	56	1.3	7.3	15	6
Total.....	30329	19954	6700	689	2.3	10.3	374	80

DISCUSSION OF RESULTS OF THE STUDY

Differentiation between infestations and mild clinically active infections with intestinal parasites was often difficult (tables 1 and 2). Twenty-three, 3.3 per cent clinical infections in the 689 patients with parasites were distributed as follows: Amebiasis—11; Giardiasis—2; Echinococcosis (hydatid cyst)—1; Taeniasis (*T. saginata*)—1; Hymenolepiasis—3; Strongyloidiasis—2; Uncinariasis—0; Enterobiasis—2; Schistosomiasis—1; Ascariasis—0. One clinical parasitic infection occurred in 1318 admissions (.076 per cent). In table 2, the discrepancy between the total number of patients infested and the total incidence of infestation was due to multiple infestations in 94 patients. Eighty of the 94 multiple infestations were with 2 parasites, 11 were with 3 parasites and 3 were with 4 parasites. Categorical discussion of infection in veterans with intestinal parasites follows.

I. INTESTINAL PROTOZOA

Amebiasis: Of the 41 cases of infestation, the parasite was detected in 35 instances in stool examinations, 3 in biopsy specimens, 1 in exudate from a perianal abscess and 2 from autopsy tissue. Seven of the 11 infections provided strains of *E. histolytica* studied by Watt and VandeGrift in 1950. The remaining 4 patients

TABLE 2
Incidence of Parasites, 1947-1954

Parasites	No. of Patients Infested	Per Cent of Patients Infested
Intestinal Protozoa		
1. <i>Endamoeba histolytica</i> *	42	6.1
2. <i>Endamoeba coli</i>	204	29.3
3. <i>Endamoeba gingivalis</i>	1	.15
4. <i>Endolimax nana</i>	269	37.4
5. <i>Iodamoeba butschlii</i>	11	1.6
6. <i>Chilomastix mesnili</i>	5	7.4
7. <i>Giardia lamblia</i> *	149	21.7
8. <i>Trichomonas hominis</i>	23	3.3
Helminths		
1. <i>Echinococcus granulosus</i> (Hydatid cyst)*.....	1	.15
2. <i>Hymenolepis nana</i> *	3	4.4
3. <i>Taenia saginata</i> *	7	1.0
4. <i>Ascaris lumbricoides</i> *	8	1.2
5. <i>Enterobius vermicularis</i> *	7	1.0
6. Hookworm*	33	4.8
7. <i>Strongyloides stercoralis</i> *	16	2.3
8. <i>Trichuris trichiura</i> *	6	.87
9. <i>Schistosoma japonicum</i> *	1	.15
Total number of patients infested.....	689	
Total incidence of infestation.....	786	

* Parasites pathogenic for man.

are reported presently. The relatively high and widespread incidence and potential viciousness of infections with *E. histolytica* identify amebiasis as the most dangerous intestinal parasitic disease. To illustrate the primary disease of the colon and the more common complications, three cases are presented. In each case the pathologic changes are emphasized to indicate the value of several diagnostic features.

Case 1. (R. #31326; Autopsy No. 698-complete). Admitted October 16, 1951. Died October 19, 1951. 37 years, man, negro. Pathological Diagnoses: Amebiasis of colon, appendix, rectum, liver and right kidney: Large perforation of hepatic flexure of colon with excavation of surfaces of adherent liver and right kidney; huge abscess and numerous small acute abscesses in right lobe of liver; jaundice; acute ulcers of mucosa of appendix, colon and rectum; numerous plasma cells in regional lymph nodes and spleen. Cirrhosis of liver; ascites.

Apparently, he became ill two years before death with swelling of the abdomen and legs. Later anorexia,

TABLE 3
Data on Malaria

	World War II	Korean War
Number of patients examined	287	87
Number of patients infested	38	42
Per cent of patients infected	13.2	48.3
Age		
a. minimum-maximum	20-35	19-30
b. average	25.7	21.2
Endemic areas	Pacific, China-Burma-India, Mediterranean	Korea
Oversea service		
a. minimum-maximum	9-36	6-24
b. average (in months)	24.6	12.8
Suppressive malarial drugs	atabrine	chloroquine
History of treatment before admission	17 (45%)	2 (4.8%)
History of relapse before admission	14	2
Interval between cessation of suppressive drugs and appearance of plasmodia (in months)		
a. minimum-maximum	(24)	(40)
b. average	3-30 9	1-12 6.1
Types of plasmodia		
a. <i>P. vivax</i>	35	42
b. <i>P. malariae</i>	2	0
c. <i>P. falciparum</i>	1	0
Treatment in this hospital	atabrine	chloroquine
Repeated treatments in this hospital with 1-2 years	atabrine 8 atabrine + chloroquine 2	chloroquine plus primaquine 1

vomiting, weakness and weight loss occurred. He served in the South Pacific and while in the Army received "needle" treatments for "bad blood." There was a history of heavy drinking.

At the time of admission he was severely ill, mentally confused, jaundiced and dehydrated. Weight loss was severe and edema of the legs was moderate. The abdomen was distended with fluid, generally tender and contained an indefinite mass in the upper part. The pupils did not react to light or accommodation. Pulse and respirations were rapid and weak; temperature was 98.6° and blood pressure was 100/80.

Blood tests for syphilis were positive. Hemoglobin was 5.7 grams (40 per cent), red blood cell count was 1.99 million, white blood cell count was 38,250, neutrophils were 91 per cent, lymphocytes were 6 per cent, myelocytes were 3 per cent, and eosinophils were 0 per cent; and red blood cells did not sickle. The urine gave a one-plus reaction for albumin, sugar was negative and rare white blood cells and numerous granular and cellular casts were in the sediment. Cephalin flocculation test was one plus. Icteric index was 15.5 units. Direct Van den Bergh was positive and the indirect was 1.4 mgms. per cent.

During the last three days of life there were nausea, frequent vomiting with coffee ground vomitus on the last day, diarrhea with passing of dark red blood, incontinence, restlessness, and finally coma and death. The pulse rate rose sharply but no fever was found.

At the hepatic flexure was an old appearing perforation which was sealed from the peritoneal cavity by densely scarred adhesions between it and the liver and right kidney (figure 1). The surfaces of the liver and kidney opposite the perforation were eroded and the centers of the erosions were excavated. The small cavity formed by this process contained exudate and feces. Papillomatous, firm, dark gray tissue lined the surface of the eroded liver whereas the deeply penetrated area of the kidney was lined by gray, finely ragged tissue.

An abscess, 15 cms. in diameter, occupied the larger part of the right lobe of the liver. It was filled with tenacious, viscous, non-stringy, slightly translucent, greenish tinted, gray exudate without a particular odor. The surface consisted of frayed necrotic tissue. Between this ragged surface and the scarred liver was an irregular grayish red zone approximately 3 mms. in thickness.

The mucosa and submucosa of the appendix and

colon, as far as the splenic flexure, were variably ulcerated and thickened. Exudate similar to that contained in the abscess, with the exception of absence of the green tint, filled the appendix and partially overlaid the ulcers. The ulcers were irregularly oval shaped and circularly placed. The bases of the ulcers were grayish-pink and grayish-yellow. They were most numerous and deepest in the cecum. Only one of the ulcers, situated in the proximal cecum, penetrated the submucosa. Small recently formed mucosal ulcers were in the rectum. No ulcers were in the stomach and small intestine. The lymph nodes of the upper part of the mesentery and about the pancreas were enlarged, firm, translucent and pale grayish-brown.

The liver was severely scarred, tan colored, and weighed 1600 grams without the exudate in the abscess. The spleen weighed 190 grams. The pulp was grayish red and the corpuscles were distinct. The peritoneal

cavity contained 500 mls. of slightly cloudy fluid. There was no evidence of peritonitis. Nothing notable was found in the remaining organs including the brain.

Bacteriological Examination. Aerobic and anaerobic cultures showed *Streptococcus anaerobius* from the liver and spleen. In addition an intermediate coliform bacillus and a *Streptococcus viridans* was cultured from the liver. Culture for *E. histolytica* from the exudate in the liver abscess was unsuccessful. Trophozoites, but no cysts, were found in the very small amount of feces in the rectum. Smears of the exudate of the liver abscess showed partially necrotic trophozoites of *E. histolytica*.

The surfaces of the abscesses, erosions and excavations of the liver and kidney were penetrated at rather evenly spaced intervals by the advancing points of the active margins of amebic infection. In this way, columns and projections of tissues were isolated. The digestive activity of the many trophozoites in the depths of the

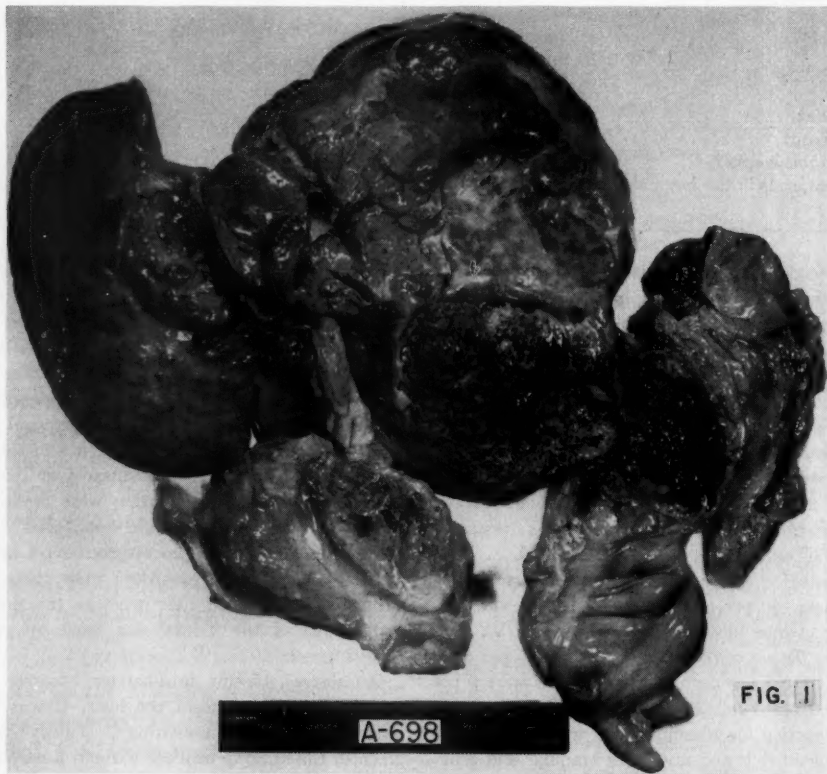


FIG. 1. Amebiasis (Case 1): Perforation of colon and sealing of margin by adhesions to liver and kidney. The photograph is an "unfolded" presentation of the perforation of the hepatic flexure of the colon and the adherence of the margin to the inferior surface of the right lobe of the liver and to the infero-anterior surface of the right kidney. Just above the swollen appendix (to right of ruler) is a nearly perforated base of an acute amebic ulcer of the cecum. The liver is cirrhotic.

crypts resulted in the formation of tiny tunnelling abscesses which infarcted the columns of tissue. Left behind were the products of digested tissue and partly digested fragments of cells. Relatively few inflammatory cells, nearly all being neutrophils, were a part of this exudate. Occasionally, variably lysed trophozoites were recognized. An abundant post-mortem growth of gram positive cocci was observed in the necrotic tissue but very few were found in the areas where trophozoites were actively digesting tissue or in the exudate. On the surface or in the hollows of the lesions a unique exudate formed owing to the presence of a basophilic colloid matrix in which the formed elements were enmeshed. The advancing margins were narrow, irregular zones of swollen and acidophilic, partially digested collagen of the stroma of the attacked parenchyma.

Ulceration of the mucosa and penetration of the muscularis was most advanced in the appendix where the tunnelling abscesses appeared like large lymphatics filled with cellular debris. Elsewhere, except for the perforation at the hepatic flexure, the ulcers were largely confined to the mucosa. No undermining of the mucosal margins occurred.

Scarring of the liver was coarse and irregular. Some of the scars were massive. They contained no parenchyma but bile ducts were numerous. The central and portal areas of the nodules of parenchyma were preserved. Narrow foci of partially atrophied cells were between the central areas and large areas of central acute and complete atrophy were in part of the right lobe.

Case 2. (R. #15618; Surg. Path. No. 1313). Admitted April 9, 1948. Died April 17, 1948 (No autopsy). 53 years, man, negro. Diagnosis: Ameboma of cecum.

For one week before admission there were gradually increasing abdominal pain and slight constipation. The temperature was slightly elevated. Examination revealed spasm, tenderness, rebound tenderness, and a small firm mass in the right lower quadrant as well as moderate dyspnea and a blood pressure of 220/110. The white blood count was 16,200, neutrophils were 81 per cent, and eosinophils were 1 per cent. Other laboratory tests were negative with the exception of sulfonamide crystals in the urine and a blood level of 6.6 mgms per cent.

Instead of the expected acute appendicitis being found at operation, there was a firm, fixed mass, approximately 5 cms. in diameter, in the wall of the proximal cecum. It presented the appearance of carcinoma. After clearance of the patient for operation by the medical service a second operation consisted of resection of the terminal ileum, appendix and colon as far as the splenic flexure. At the end of the operation evidence of

circulatory collapse rather suddenly appeared. Several hours after operation no movements of the left side could be elicited. He died 12 hours after the operation.

Just beyond the ileocecal valve was a solitary ulcer 6 cms. in diameter. The mucosal margin was elevated and slightly undermined. The wall and adjacent fat were thickened and hardened by scar tissue. Yellowish gray exudate covered the ulcer. The base consisted of faintly translucent and scarred submucosa. Its surface was studded by numerous tiny reddish foci. Three succulent, homogeneous, grayish pink lymph nodes were in the corresponding mesentery. The largest lymph node was 2.5 cms. in diameter.

The exudate trapped in the undermined margins of the ulcer had a colloid matrix in which neutrophils, nuclear fragments and several trophozoites were enmeshed. Chronically inflamed and scarred granulation tissue lined the ulcer. The surface of the granulation tissue, which formed the actual margin of the ulcer, was, however, a narrow zone of brightly acidophilic and swollen, partially digested collagen stroma. The remainder of the wall and the adjacent fat were moderately scarred and chronically inflamed. No reaction was about several trophozoites in the granulation tissue. An occasional gram negative bacillus was stained in the exudate trapped in the undermined margins.

Case 3. (Case previously reported by Ginsberg and Miller (1952).) (R. #27548; Surg. Path. No. 2435). Admitted May 26, 1949. Discharged October 31, 1949. 34 years, man, negro. Diagnosis: Isolated amebic abscess of right lung.

He had gradually increasing cough, small hemoptyses, dull aching pain in right anterior thorax which pain was aggravated by coughing, and weight loss. During World War II he served in India approximately one year.

Physical examination was negative except for slight fever. A full complement of laboratory tests revealed a slight leukocytosis and slight increase in the per cent of neutrophils; the highest per cent of eosinophils was 3. Roentgenograms demonstrated a slowly enlarging density at the base of the right lung.

Nine months after the onset of symptoms the middle and lower lobes of the right lung were removed (on August 26) for an abscess in the central and upper part of the lower lobe with extension to the middle lobe. The abscess was 5 cms. in diameter. It was filled with tenacious, viscous, non-stringy, slightly translucent, gray exudate without a particular odor. The surface was finely granular and slightly reddened. Scarring about the abscess was considerable except for slight scarring about the extension in the middle lobe. Exudate partly filled several bronchi draining the abscess. An inter-



FIG. 2. Amebic abscess of right lobe of liver (Case 2): The tenacious, viscid, non-stringy, slightly translucent, gray exudate filling the abscess was indicative of amebic abscess. Microscopic examination revealed a variety of processes in the liver which were suggestive of "tropical liver" (53; pp. 533-534).

mediate coliform bacillus was the sole bacterium cultured on aerobic and anaerobic media.

Many trophozoites were in the active zone of infection which was between the advancing margin and the body of exudate. The exudate was a basophilic colloid matrix in which nuclear fragments and occasional

neutrophils, eosinophils and partly lysed trophozoites were enmeshed. The advancing margin was a well defined, compact zone of swollen, acidophilic collagen of the stroma of the granulation tissue lining the abscess. It was quite irregular. Trophozoites were most evident in the deepest penetrations of the margin. Many plasma

cells were in the granulation tissue whereas eosinophils were rare. The wall of the cavity was severely scarred and chronically inflamed; eosinophils were readily seen. Occasional gram-negative diplobacilli were in the exudate near the advancing margin.

No benefit from prolonged treatment with penicillin, given parenterally and by aerosol, was obtained pre-operatively. The diagnosis of amebiasis was established on the seventh post-operative day. Emetine, .06 grams per day, was given 5 times. This treatment was discontinued owing to a severe cardiac reaction to it. Then aureomycin, 2.0 grams per day in 8 doses, was given for, approximately, 4 weeks. Thereafter, until discharge, the dosage was 1.0 gram per day in 4 doses. Parental penicillin was given throughout the post-operative period of 66 days.

On the tenth post-operative day a bronchopleural fistula appeared. Open drainage and, later, a plastic procedure were required. A roentgenogram of the colon, following barium, was negative. One stool of many examined post-operatively was positive for *E. histolytica* (trophozoites only). He was well at the time of the last follow-up examination 5 years after discharge.

Emphasis is placed on the culturing and scraping of the very margins of the lesions by the physician seeking a diagnosis because this is the location of the active infection.

In order to illustrate the value of culture for *E. histolytica* in diagnosis, the following case is presented. Examination of the exudate by appropriate special tests revealed no trophozoites. Furthermore, the case is unique because no other instance of perianal abscess has been found in the cited literature.

Case 4. (R. #42449). Admitted March 20, 1954. Discharged April 27, 1954. 23 years, man, negro. Diagnosis: Amebic perianal abscess.

For approximately 2 weeks the patient passed blood clots by rectum and thereafter complained of pain and discomfort in various parts of the abdomen and in the rectum. Finally, the abdominal pains were generalized and the rectal pain was severe. Examination revealed slight tenderness over the liver and in the right lower quadrant of the abdomen, and an exquisitely tender rectum. Temperature ranged from normal to 102°; white blood count from 11,400 to 12,800, neutrophils from 68 per cent to 78 per cent, eosinophils from 0 to 4 per cent, and hemoglobin was 73.5 per cent (10.7 grams). (He never traveled outside the United States; some of his army service was in the South.)



FIG. 3. Amebic abscess of lower lobe of right lung (Case 3): In the left portion of the abscess and attached to the wall is the remainder of the tenacious, viscid, non-stringy, slightly translucent, gray exudate which filled the abscess. The exudate had no particular odor. Not shown is the extension (to the left) in the middle lobe. The severe scarring is usual about chronic amebic lesions.

Fifteen ml. of "gray purulent material" was evacuated from the abscess, which was unroofed, on March 26. Twenty-four hours after operation a culture for *E. histolytica* was teeming with trophozoites. Routine cultures showed an intermediate coliform bacillus and *Streptococcus zymogenes*. Stool examination for parasites before operation were not requested. After operation they were repeatedly negative for *E. histolytica* but did contain cysts of *Giardia lamblia*. Aureomycin, 500 mg. every 6 hours, was given for 2 weeks after operation for the amebic abscess. Atabrine, 1½ grains every 8 hours for 3 days, was given for the *Giardia* infestation. The 4 days following operation, terramycin, 250 mg. every 6 hours, was given. Owing to a recurrent pain in the right upper quadrant 3 days after discontinuance of the aureomycin therapy the antibiotic was given again for 4 days (250 mg. every 6 hours). The abscess healed promptly and the stools were negative for *G. lamblia*.

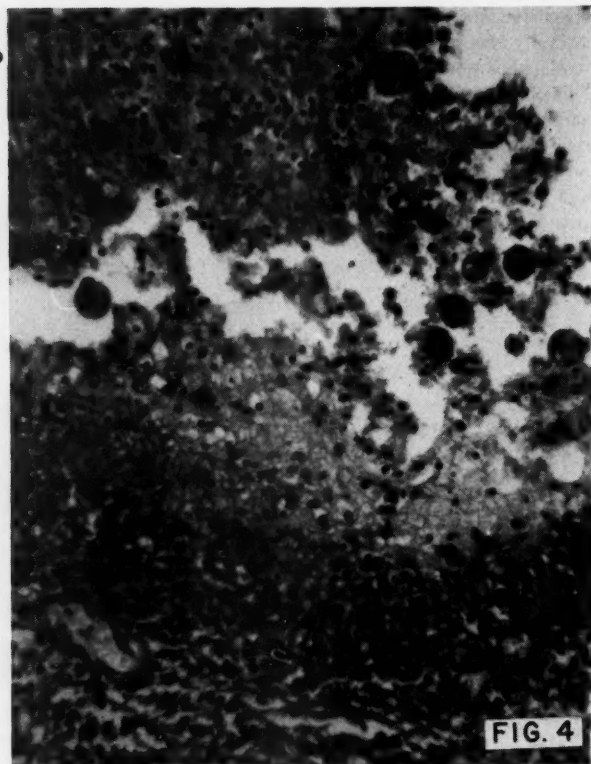


FIG. 4. Wall of amebic abscess of lung (Case 3): The advancing margin of partially digested collagen stroma of the scarred granulation tissue (bottom) stands out as a dark, narrow zone. At the top is the unique exudate of amebic lesions. The basophilic, colloid matrix enmeshes the nuclear debris, occasional neutrophils and eosinophils and trophozoites. The narrow zone between the unique exudate and the margin is the active zone of the infection. Here, the majority of the trophozoites and bacteria are observed. The trophozoites are variously colored owing to a difference in PAS-positive content of the cytoplasm. (PAS reaction; Harris hematoxylin counterstain; $10\times-8\times-15''$.)

during the last week. He has remained well during the 8 months since discharge.

The extensive, relentlessly progressive nature of the disease in Case 1 clearly demonstrates that the advancing margins of the lesions of *E. histolytica* respect no tissues. More extensive instances have been reported, one of the most interesting being reported by Chapman, Schwartz and Haislip (1948). Many abscesses were in the upper and lower lobes of the lungs, which finding led to their consideration of an embolic origin. A similar cause is probably responsible for the lung abscess described in Case 3. Sullivan and Bailey (1951) reported 4 cases of lung ab-

cess in veterans (Pacific and C.B.I. theaters) without preceding clinical amebiasis which circumstance existed in Case 3. Anderson and associates (1953) state that the incidence of lung abscess at autopsy is 3 per cent. It is the second most common metastatic focus, the liver being the first, and the brain (Orbison, et al., 1951) having a lower incidence than does the lung.

Metastatic lesions in amebiasis are remarkable because of their infrequent occurrence. It is our belief that the low incidence occurs since trophozoites and a commensal bacterium must metastasize together for without the bacterium, growth of the amoeba cannot be initiated or

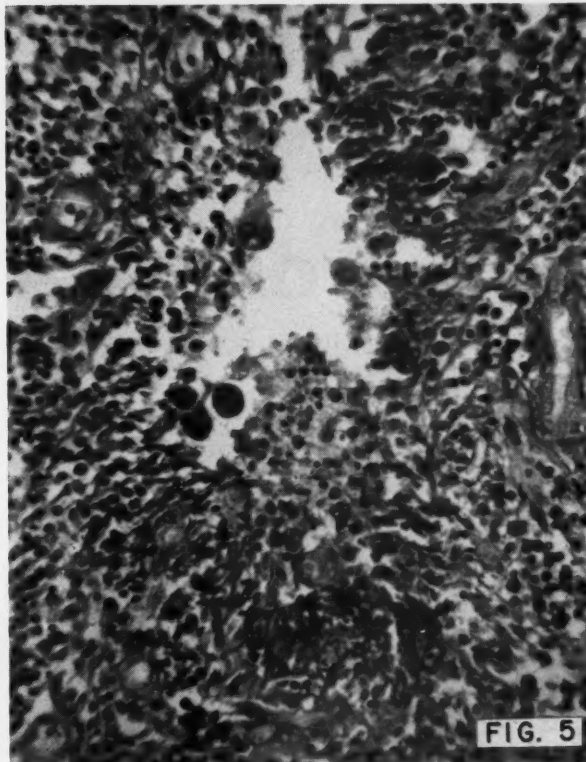


FIG. 5. Amebic abscess of lung (Case 3): This penetration of the advancing margin of the abscess is an example of the characteristic penetration of the advancing margin of amebic abscesses. Hence, the surfaces of the abscesses are irregular or granular. (The large capillaries in the granulation tissue impart a reddish color to the surfaces of amebic lesions.) (PAS reaction; Harris hematoxylin counterstain; $10\times-8\times-15''$.)

maintained. Furthermore, our studies indicate that the commensal bacterium or bacteria grow sparsely and, without exception, are nonpathogenic. As a rule they are gram-negative bacilli of the intermediate coliform group. They may resemble closely *Aerobacter aerogenes* or *Escherichia coli* but a careful study will disclose atypical biological features. Cultures of the members of the intermediate coliform group are productive, usually, of objectionable odors. The absence of such odors in amebic abscesses is explained by the sparse growth of the members. *A. aerogenes* was reported as a concomitant bacterium (Watt and VandeGrift, 1950) but a repeated study disclosed atypical reactions. We strongly doubt that trophozoites can survive with pathogenic bacteria

or "secondary invaders." Trophozoites appear to feed on connective tissue stroma which they prepare for ingestion by first partially digesting with enzymes they secrete. No erythrocytes, bacteria or nuclear fragments have been identified by us in the cytoplasm of the many trophozoites studied. (See figure 6.)

Ameboma, or productive scarring of chronic amebic ulcers of the colon, occur most frequently in the proximal colon as do the ulcers of ordinary amebiasis of the colon. Case 2 demonstrates well the errors made and reported by others in confusing these indolent lesions with carcinoma which they closely resemble. Gunn and Howard (1931), Stempien and Wilkins (1951), and Soderman and Engle (1952) describe

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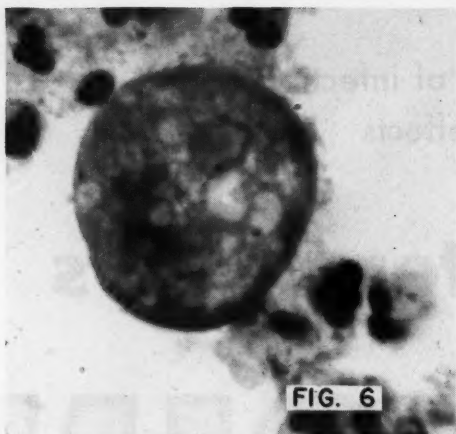


FIG. 6. Trophozoite of *E. histolytica* (Case 3): In the upper right center is the nucleus. Below and to the left of center is a dark, irregular mass of PAS-positive material, the staining and cytochemical reactions of which are identical with those of the partially digested collagen of the advancing margin of the abscess of the lung. Vacuoles of various sizes are shown. (No red blood cells, nuclear fragments or bacteria were identified in the cytoplasm of all trophozoites examined.) (PAS reaction; Harris hematoxylin stain; $92\times-12\times-10''$.)

the clinical and pathological aspects. The lesions were located in all parts of the colon and the rectum and several produced severe stenosis with obstruction. Amebic colitis, which in some cases was indistinguishable from ulcerative colitis of other etiology was reported in veterans by Kean (1953). Colectomy was performed in several patients.

Absence of trophozoites and cysts in the presence of severe amebiasis, even with many examinations, occurs in sufficient numbers (Chapman, 1948; Stempien and Wilkins, 1951; Kean, 1953) to warrant the conclusion, drawn by others, that the absence of *E. histolytica* in suspected cases of amebiasis of the colon does not preclude the presence of the disease. An additional instance is reported as follows: The lesions in a 34 year old white "negative" patient, who came to autopsy at the 118th General Hospital, Leyte, in 1945, without diagnosis after an acute illness of 2 weeks, were acute ulcers of the cecum, ascending and proximal half of the transverse colon. Two large perforations of the

cecum resulted in a fatal bacterial peritonitis. Numerous trophozoites were in the lesions. Five stool examinations, including a special search for *E. histolytica*, were negative. No satisfactory explanation for the negative examinations of the stools of these patients has been offered.

One gross feature of amebic lesions, especially abscesses, is diagnostic. The exudate overlying ulcers or trapped in the undermined margins and filling the abscesses is unique as described in cases 1 and 3. It is tenacious, viscous, non-stringy, slightly translucent, gray and without particular odor. Discolorations by contamination with bile, blood and feces may occur. Characteristic, but not diagnostic, is the reddish, irregular advancing margin of a lesion.

Microscopically, the basophilic colloid matrix of the exudate is diagnostic. Features contributing to the diagnostic appearance are the spaced nuclear debris and the few inflammatory cells. By itself, the advancing margin of a lesion is not diagnostic because the partially digested collagen has an appearance, staining properties, and cytochemical reactions like those of the advancing margin of a peptic ulcer.

The absence of fragments of necrotic tissue in amebic exudate, particularly in regard to the liver abscess in Case 1, indicates that the amebic enzymes are capable of digesting necrotic tissue as well as viable tissue. From our study of the microscopic findings of amebiasis it is our conclusion that trophozoites migrate in tissues after the death of the tissues. Migrated trophozoites are often shrunken and excessively basophilic but they are best identified by an absence of tissue reaction to them.

The regional lymph nodes in Cases 2 and 3 manifested little reaction to the nearby ulcer and abscess. Occasional plasma cells and few eosinophils were in the cords. Plasma cells, on the other hand, were numerous in the abdominal lymph nodes and spleen in Case 1. The other reactive organs in Case 1 showed changes indicative of severe exhaustion and relatively little toxicity.

A recent and reliable study of the geographical incidence of amebic infestation by McHardy (1953) indicates that Maryland is in the intermediate group of states. The descending order of incidence by states was Alabama—23 per cent; Mississippi—12 per cent; Arizona and Utah—10 per cent; North Carolina and Florida—9 per cent; Illinois and New Mexico—8 per cent; Louisiana and Georgia—6 per cent; Tennessee—5 per cent and Maryland (with 5 other states)—4 per cent. The incidence for the United States was 3.9 per cent. The incidence for Maryland presently reported in veteran patients as 6.1 per cent is artificially high owing to the partial selection of cases. The incidences cited and the case reports presented stand out boldly to alert physicians to this potentially serious disease. Fortunately, the proportion of infection to in-

festation is low, not only in Maryland as represented by the present 3.3 per cent of clinical infection, but also in Georgia as reported by Brooke, Donaldson and Brown (1954) who made an incidence survey of ambulatory patients from various parts of Georgia in the Veterans Hospital, Chamblee. The proportion of clinical infections in the Georgia survey was 10.8 per cent.

Giardiasis: The high incidence of 21.7 per cent of *G. lamblia* is unexplained. Inasmuch as the incidence is usually considered higher in children than adults, the high per cent is even more remarkable. This parasite has been generally considered nonpathogenic until the last decade and its occurrence was ignored therefore during the examinations of specimens in the first 5 surveys in table 4 A. It is included, however, in the remaining surveys of table 4 A and in table 4 B.

TABLE 4A

Effect of Treatment and Public Health Measures on Incidence of Parasitic Infestations as Demonstrated by Incidence Surveys
Incident surveys in the Pacific, Caribbean, Alaska and the United States (1944-1954)

Group	Date of Survey	No. Cases	% <i>E. histolytica</i>	% <i>Giardia lamblia</i>	% Strongyloides	% Hookworm	% Schistosoma (S. japonicum)	% Ascariis	% Trichuris	Aver. Max. % Eosinophils	Max. % Eosinophils	Aver. Max. White Blood Cell Counts	Max. White Blood Cell Counts	Age
1. 118 Gen. Hosp.	1944 1945	272	14	—	3.3	31	100	13	21	47	92	15,700	53,500	Soldiers
2. Limbuan, Leyte	1945	94	8.5	—	0	100	98	89	84	19.5	68	13,100	28,500	12.7 (Aver.)
3. Bato, Leyte	1945	117	0*	—	0	92	0	95	88	16.6	47	10,100	21,100	16.1 (Aver.)
4. 118 G.H.M. Det.	1945	126	0	—	1.6	6.3	0	3.9	2.4	4.3	32	8,100	16,000	Soldiers
5. Moore Gen. Hosp.	1946	182	3.3	—	.55	6.6	16	0	4.7	—	—	—	—	Soldiers
6. Puerto Ricans	1946	13	7.5	—	38	23	100†	0	69	16	35	—	—	Soldiers
7. Dominican Rep. (41)	1949 1950	1139	34.2	4.9	14.1	59.2	0	20.1	58.9	—	—	—	—	Adult Natives
8. Tahiti (34)	1953?	560	22.3	10	1.3	38	0	12.9	44	—	—	—	—	Native adults and children
9. Kotzebue area (Alaska) (28)	1950	100	0	1	0	0	0	0	0	(Enterobius—43% Diphyllobothrium sp.—6%)				Native adults and children
10. VA Patients in Halloran Hosp. (33)	1947 1951	2500	1.1	.6	.84	2.1	.88†	.16	2	—	—	—	—	Veterans
11. VA Hosp. Chamblee, Ga. (10)	1951 1952	400	9.3	3	.8	1.7	0	.3	0.5	—	—	—	—	Veterans
12. VA Hosp. Fort Howard	1947 1954	689	6.1	21.7	2.3	4.8	.15	1.2	.87	—	—	—	—	Veterans
13. Atlanta, Ga. (24)	1946 1948	926	5.9	10	.1	.9	0	.3	.3	(Enterobius (children) 23.4%)				White adults and children

* No special search.

† *S. mansoni*.

EXPLANATION OF TABLE 4A

Group 1. Patients with schistosomiasis were in the 118th General Hospital, Tanauan, Leyte, P.I., during December 1944 and the first nine months of 1945. The number of stool specimens examined from each patient varied from one to several score. Data concerning the white blood cell counts and eosinophils were from 183 patients with adequate blood studies in the mature ova-symptomatic group. The averages are of maximum counts and percentages. Significant differences in data were from patients with immature ova only and patients with and without symptoms in each category of ova.

Group 2. School pupils lived in the barrio of Limbuan, Tanauan, Leyte. Limbuan was situated one mile inland off the east coast in the area endemic for schistosomiasis. Generally, the children were pale and stunted, and many had protruding abdomens. The number of specimens examined varied for 2 to 8 for each pupil. Special searches were made for cysts and trophozoites of *E. histolytica*. One blood examination was made per patient.

Group 3. School pupils lived in Bato, situated on the central part of the western coast of Leyte. Schistosomiasis was unknown in this area. Generally, the children were alert, active and appeared in good health. Two specimens per patient were examined. No special search was made for cysts and trophozoites of *E. histolytica*. One blood examination was made per patient.

Group 4. These particular soldiers of the Medical Detachment of the 118th General Hospital arrived on Leyte with the soldiers comprising Group 1. Thirty-three per cent of the soldiers admitted exposure in the same waters in which members of Group 1 contracted schistosomiasis. The number of stool specimens per patient varied considerably. All specimens were negative for ova of *S. japonicum* and no clinical diagnosis of schistosomiasis was warranted. Special tests were employed in the search for *E. histolytica*. The survey was made 10 months (Sept. 1945) after the outbreak of schistosomiasis.

Group 5. The patients of this group were evacuated to the Moore General Hospital, Swananoa, North Carolina, from the area endemic for schistosomiasis in Leyte. Twenty-six of these patients were Group 1 patients. All were under prolonged study and treatment for schistosomiasis and many stool examinations were made per patient. Treatment was given for most of the parasitic infections, other than the schistosomiasis, they manifested earlier. Specimens of the 16 per cent of the patients positive for *S. japonicum* ova were positive within 7 weeks of the survey on January 21-22, 1946. The general health of nearly all 182 patients was good. The white blood counts and eosinophil per cents of the patients at the time of the survey were largely normal, the white blood counts being

normal in a greater number of cases than were the eosinophil per cents.

Group 6. The Puerto Rican soldiers were in Moore General Hospital for observation and treatment of schistosomiasis (*S. mansoni*). Many stool examinations were made per patient and treatment for schistosomiasis and the other parasitic infections they manifested earlier was given. Their general health was good.

Group 7. Reported by Mackie, Larsh and Mackie (1951). The survey included two groups of adult natives living on adjacent properties. Clinical parasitic infections were uncommon. One post-cathartic stool specimen was examined per patient.

Group 8. Reported by Kessel, Parrish and Parrish (1954). It includes 300 natives from schools and homes, 200 patients without gastrointestinal symptoms and 60 patients with acute gastrointestinal symptoms. Three specimens per person were examined.

Group 9. Reported by Hitchcock (1951). Six specimens were examined per patient. Examinations included special searches for *E. histolytica* and *E. vermicularis*; 6 specimens and six scotch-tape anal swabs, respectively, were examined on the negative cases. The ages of the 32 males and 76 females varied from 7 months to 75 years. The incidence of pin worm did not vary according to sex or age. The natives came from 19 villages.

Group 10. Reported by Kean (1953). Approximately two stool specimens per veteran were examined. The distribution of overseas service was: Pacific area—63. Puerto Rico—37. U. S.—22. Continental Asia—17. Europe—6. Others—15. Two-thirds of the 160 "positive" patients were admitted to the hospital for symptoms attributed to parasitic infections. Halloran Hospital was on Staten Island, N. Y.

Group 11. Reported by Brooke, Donaldson and Brown (1954). The survey was made on ambulatory veterans who were given magnesium sulfate and delivered specimens a short time later. An average of 2.6 post-cathartic specimens per patient were collected. Routine and special examinations were made on each specimen. Four of the patients were diagnosed as having amebiasis at the time of admission to the hospital. Four of the patients were females and 26 were colored.

Group 12. Presently reported.

Group 13. Reported by Goldman and Johnson (1952). The survey was made on a relatively homogeneous group of white adults and children who were not in institutions. They were in a low income bracket. One normally passed specimen was examined per person. In addition, the anal swab technique was performed once on each of 145 white children for an *Enterobius* survey. Twenty-three and four-tenths per cent of the children were positive.

Opinions of various authorities still vary in regard to the pathogenicity of *G. lamblia*.

Kean (1953) reported "outright" diarrhea and dyspepsia in half the 15 cases without questioning the pathogenic nature of the flagellate. Battacharjea (1943) based his conclusion of

pathogenicity on study of 52 patients with diarrhea. Weselman (1943) reported giardiasis of the duodenum and bile ducts and Chandhuri (1943) attributed steatorrhea in his case to *G. lamblia*. Katsampes and associates (1944) showed experimentally that absorption of

TABLE 4B

Incidence Surveys of Intestinal Parasites Encountered in the Mediterranean Area, 1944-1945

	Food Handlers			American Soldier Patients	French Senegalese Soldiers	Brazilian Soldiers
	Italians	American	German			
Number of specimens.....	16,787	2,810	1,410	3,804	422	106
Number of persons examined for parasites.....	11,191	2,810	1,410	2,113	422	106
Number of persons with parasites.....	6,019	748	543	520	168	94
Per cent of infestation.....	53.8	30.2	38.5	24.6	39.8	88.7
<i>I. Protozoa: (Per cents)</i>						
1. <i>Endamoeba histolytica</i> *.....	11.7	4.7	5.9	9.3	3.1	7.5
2. <i>Endamoeba coli</i>	28.5	12.5	21.1	16.6	15.0	26.4
3. <i>Endolimax nana</i>	12.1	6.3	12.5	5.8	6.9	13.2
4. <i>Iodamoeba butschlii</i>	9.6	3.0	4.9	3.3	5.0	8.5
5. <i>Chilomastix mesnili</i>	0.9	1.0	0.5	3.3	0.9	0.9
6. <i>Giardia lamblia</i> *.....	5.3	1.1	4.6	1.7	1.6	4.7
7. <i>Trichomonas hominis</i>	0.04	0	0	2.8	0	0
8. <i>Isopora hominis</i> *.....	0	0	0	0.01	0	0
9. <i>Balantidium coli</i> *.....	0	0	0	0.1	0.5	0
<i>II. Helminths: (Per cents)</i>						
1. <i>Ascaris lumbricoides</i> *.....	38.6	1.2	3.1	1.9	12.6	22.6
2. Hookworm*.....	0.3	2.3	0	1.3	1.4	66.2
3. <i>Heterodera radicola</i>	1.2	0.3	0.9	0.2	0.2	0.2
4. <i>Enterobius vermicularis</i> *.....	0.4	0.04	0.14	0.14	0	0.9
5. <i>Strongyloides stercoralis</i> *.....	0.1	0.07	0	0.4	0.5	11.3
6. <i>Trichuris trichiura</i> *.....	23.6	1.0	4.3	1.4	11.9	53.7
7. <i>Trichostrongylus</i> sp.*.....	0.01	0	0	0	0	0
8. <i>Diphylobothrium latum</i> *.....	0	0	0.1	0	0	0
9. <i>Hymenolepis nana</i> *.....	1.0	0.1	0.1	0.4	0.5	0.9
10. <i>Taenia saginata</i> *.....	0	0	0	0.1	0.2	0
11. <i>Schistosoma mansoni</i> *.....	0	0	0	0	0	7.5
12. <i>Schistosoma haematobium</i> *.....	0	0	0	0.1	0	0

* Parasites pathogenic for man.

EXPLANATION OF TABLE 4B

The surveys were made by the 15th Medical General Laboratory, United States Army, Mediterranean Area. The Brazilian soldiers were surveyed the same week they arrived from Brazil. The Senegalese soldiers walked from French Equatorial Africa to Egypt and then were transported to Italy. They were surveyed one month after arrival in Italy. The high standard of personal hygiene of these natives-turned-soldiers was generally remarked. The German prisoners surrendered during the termination of the North African Campaign and had served throughout the campaign. They had been isolated in camps in Italy 6 months before they were surveyed. The methods described presently were the methods employed in the surveys.

vitamin A in patients was improved after the elimination of the infection by medication. Only 1 case in our 149 cases demonstrated obvious evidence of giardiasis. Even so, we believe it pathogenic, but of a low order, and only in instances when great numbers of the flagellate are present. Our patient was a 24 year old negro who presented pain in the abdomen and tenderness in the right lower quadrant of precipitant onset. A diagnosis of acute appendicitis was not

made. Stool examinations were requested, the parasite found and successful treatment with atabrine undertaken. A doubtful case was a 31 year old white man whose complaints suggested psychosomatic disease. A week before admission he had diarrhea and abdominal pain for nearly 24 hours. Although he was "cured" by atabrine therapy, some benefit was probably obtained from concomitant psychotherapy. Because giardiasis is the easiest parasitic disease to cure

and because *G. lamblia* is of a low order of pathogenicity, giardiasis is relegated to an unimportant status as a disease.

II. HELMINTHS

Echinococcosis (hydatid cyst): In his comprehensive study of hydatid disease, Magath (1937) reported Maryland as one of 5 states in which the disease was proved indigenous. This was based on the case report of R. E. Garrett, 1906, describing a cyst in a negro who had never been out of the state. The other 13 cases in the states were, apparently, contracted abroad or the history was too unreliable to derive an accurate conclusion regarding the location of contraction of the disease. The present case was of uncertain location of contraction but it was believed the infection took place while he was in the North African and Italian campaigns. The cyst in the 26 year old negro was 8 cms. in diameter and was situated in the upper lobe of the left lung. Roentgenograms revealed a fluid level in the cyst. The size of the cyst was compatible with a duration of 8 years which elapsed from the time of stay in the endemic territory to the time it was removed. (The very slow growth of the hydatid cysts is a generally recognized fact.) Aspiration of the cyst before operation established the diagnosis by finding hooklets and motile scolices of *E. granulosus* in the fluid sediment. Spilling of the contents of a cyst during operation or aspiration frequently seeds the parasite in the tissues at the site of contamination.

Taeniasis: One patient of the 7 infested was considered a clinical infection. This case was a 52 year old white man who complained of increasing weakness and passing parts of worms. Per cent of eosinophils was 6; hemoglobin was 12.9 grams (89 per cent). Following several treatments with aspidium over a period of 2 years he finally passed a *T. saginata*, with scolece, 20 feet long. He has remained well during the three years since he was discharged.

Hymenolepiasis: Infestation is either auto or direct from patient to patient. This circumstance

is most likely responsible for *H. nana* being the most common tape worm infesting humans and for the large number of the worms found in occasional individuals. One of our 3 infected cases was a 27 year old white man who complained of increasingly severe constipation and recent vague abdominal pain. No relief was obtained by taking cathartics. Eosinophils varied from 5 per cent to 7 per cent. Following treatment with aspidium (3 grams followed by 2 ounces of magnesium sulfate) he passed large numbers of immature *H. nana* and became asymptomatic.

Strongyloidiasis: Owing to the damage to the intestinal mucosa by the burrowing of *S. stercoralis* and the long persistence of the infection as a result, probably, of repeated auto-infestation, strongyloidiasis is generally considered the most severe and chronic of the infections in this country by helminths. Bodon (1941) and Levin (1943) present evidence indicating persistence of infection for 20 years and Palmer (1944) for 30 years. Craig and Faust (1951) attribute the chronicity to repeated auto-infestations leading to hyperinfestation. Kyle and associates (1948) emphasize the possibility of a fatal outcome. The lack of effective therapy adds greatly to the seriousness of the disease. Jones (1950) and Jones and Abadie (1954) have admirably described the various aspects of the disease in veterans in New Orleans and emphasized the high efficacy of diagnoses by examining duodenal intubation fluid (77 per cent on a single aspiration) in addition to stools (72 per cent of patients with 9.7 stool examinations per patient). Eosinophilia with chronic helminthic infections in this country is generally highest in cases of strongyloidiasis. Strongyloidiasis outbreaks in troops were unrecognized during the war owing, largely, to the difficulty in establishing the diagnosis by finding the larvae in the stools. Liebow and Hannum (1946) report a study of Marines evacuated to New Zealand after the Solomon Islands campaign in which there was a high rate of mixed infection with *S.*

stercoralis and hookworm; eosinophilia was moderately advanced. The 2 present cases manifested the usual abdominal pain and uneasiness with occasional vomiting and diarrhea. Maximum eosinophilia was 13 per cent.

Uncinariasis: The high incidence of hookworm infestation in the natives of the Pacific, Asiatic, Caribbean and South American areas, as noted in tables 4 A and 4 B and by Strong (1944; p. 1252) in these and other tropical areas, was reflected in the health of troops serving in the areas, and especially in combat troops who fought and lived on or in the wet ground. Studies on troops in the Pacific and Asiatic areas within a short time after infestation to several years later revealed the expected high incidence of infestation, and in, at least, two localities, an explosively acute hookworm disease. Today, the majority of the veterans of World War II have outlived the worms with which they were infested. Due to the relatively high state of public and personal hygiene practiced in this country, the incidence of hookworm infestation as noted in veterans in Maryland, Georgia and New York approaches the incidence noted in civilians (Table 4 A). Still to be concerned with are the Korean veterans and non-Korean overseas veterans.

Marines evacuated to New Zealand after the Solomon Islands campaign were the first American troops to manifest a high incidence of hookworm infestation. The report of the disease in the Marines by Liebow and Hannum (1946) included the findings of concomitant strongyloidiasis. The several conclusions tenable were the rate of infection was high, eosinophilia was striking, *Ancylostoma duodenale* was the common species of hookworm, and that treatment with trichlorethylene had little effect even in patients with light infections. Associated strongyloidiasis appeared to have little influence on the resistance of *A. duodenale* to trichlorethylene, however, because Stoll and Loughlin (1946), Rogers and Dammin (1946), Most, Hayman and Wilson (1946) and Kean (1953),

TABLE 5
Known Natural Durations of Infestations by Parasites in Man

Disease	Average Duration	Maximum Duration
I. Intestinal Protozoa		
Amoebiasis	months-years	20 years
Giardiasis	(unknown)	(unknown)
II. Helminths		
Echinococcosis	years	years
Hymenolepiasis*	years	years
Taeniasis	years	years
Ascariasis	1 year	1 year
Enterobiasis*	years	years
Uncinariasis	6-12 months	6-8 years
Strongyloidiasis*	years	20 years
		30 years
Trichuriasis	1-3 months	years
Schistosomiasis (<i>S. japonicum</i>)	10 years	15 years
Schistosomiasis (<i>S. mansoni</i>)	years	20 years
III. Malaria		
<i>P. vivax</i>	1-1½ years	3-4 years
<i>P. malariae</i>	years	12-21 to 30 years
<i>P. falciparum</i>	1 year	1 year

* Auto-infestation.

have recognized the refractory nature of this species in infections in troops and veterans to treatment with trichlorethylene as compared to the far more successful results in treating hookworm disease caused by *Necator americanus*. A study of hookworm infestation by Stoll and Loughlin (1946) on Guam, illustrates the considerable increase in incidence which may occur as the result of combat of troops in endemic areas. Garrison forces on Guam and the Marines evacuated to Guam from the Leyte Campaign had the following incidence of the area of the United States where they lived previous to service—Southern coastal states, 20.8 per cent and 48.2 per cent; other Southern states including Maryland, 4.7 per cent and 37 per cent; Northern and Western states, 2.7 per cent and 31.6 per cent. Most, Hayman and Wilson (1946) found the incidence in troops returning to the United States from the Pacific 1.8 times the incidence in troops whose entire service was in the United States.

The explosive outbreaks of hookworm disease in Assam and Burma and in Leyte were amazing clinical spectacles and were exceeded in morbidity from parasitic diseases only by the hectic outbreak of schistosomiasis in Leyte. Rogers and Dammin (1946) describe well the outbreak in troops stationed in Assam and Burma. The acute syndrome comprised anorexia, nausea, vomiting, abdominal pain, diarrhea and weight loss. Cough began soon after exposure and preceded, as a rule, the abdominal symptoms. The development of maximum eosinophilia occurred, on the average, 30 days after the onset of symptoms. The average maximum white blood cell count was 13,700 and the average maximum eosinophil per cent was 34. Roentgenograms of the intestine after barium demonstrated a cogwheel pattern of the jejunum and lower duodenum owing, presumably, to swollen mucosal folds. The outbreaks on Leyte followed prolonged stays in wet fox holes, and in one severely affected group, in fox holes dug at the site of a previous village. Radiographs of the lungs of these patients commonly showed diffuse "snow-flaking" during the passage of the larvae. Eosinophilia in several instances was 90 per cent. Itching and skin rash shortly after exposure was well remembered by nearly all troops infected. A good description of a first skin rash of uncinariasis is by Blount (1950), who describes the quick development of the rash in the skin of the legs of a 14 year old white boy who waded in bogs and puddles alongside a stream near Tokyo. There were numerous purplish macules about 1 mm. in diameter in the exposed skin. Itching was intolerable for several days.

Over half the 33 cases of hookworm infestation in the present study were in veterans with military service in the countries bordering the Mediterranean Sea where *A. duodenale* causes nearly all infections. Only a few cases failed to respond well to treatment with Crystalloid ST37 (Caprokol) and required repeated treatments over a period of several years. No clinical infection was noted in these cases which is a remarkable circumstance when considering the

severity of many of the infections overseas. The circumstance emphasizes the necessity of repeated exposures resulting in the accumulation of numerous worms in the small intestine in order to achieve the chronic hookworm disease with its characteristic symptoms of laziness, weakness and anemia.

Enterobiasis: The low incidence of 1.0 per cent (7 cases) of infestation with *Enterobius vermicularis* is attributed to the too-little use of the anal swab technique, Hall (1937) and Sawitz and associates (1939). The high value of its use for diagnosing enterobiasis is generally attested. The incidence surveys in Table 4 A fail to report the given incidences (very low) of *E. vermicularis* except in the two surveys in which the anal swab was employed. The high incidence in the Alaskan natives is little higher than the incidence of 35 per cent in the population randomly surveyed by Cram, and reported by Strong (1944; p. 1230), in Washington, D. C. The incidence reported by Goldman and Johnson (1952) of 23.4 per cent in persons in Atlanta, Ga., was derived from 1 examination per person as compared to 6 examinations per negative Alaskan native by Hitchcock (1951).

The two presently infected cases with pruritus ani, especially at night, characterize the symptoms of the disease in general.

Schistosomiasis: Our 1 case recalls the trying days on Leyte during December 1944 and the early months of 1945 when hundreds of ill troops descended on the overworked hospital staffs who soon discovered the cause of the illness, instituted correct therapy and later saw the disappearance of new cases as indoctrination of troops in public and personal hygiene brought an end of exposures to the cercariae of *Schistosoma japonicum* in the fresh waters in the endemic area. By now, schistosomiasis has probably spent itself beyond clinical expression in these former troops owing to the intensive therapy during months of observation, and to the near attainment of the end of the life cycle of the parasite. Unless the scarring and chronic inflammation of the intestines and rectum caused by prolonged

activity of the disease is conducive to the contraction of other disease, the Leyte schistosomiasis has, at last, quietly disappeared. Nevertheless, several aspects of our case are worth noting.

Case 5. (R. #10524). Admitted December 8, 1946. Discharged May 1, 1947. 28 years, man, white. Diagnosis: Intestinal schistosomiasis (*S. japonicum*).

Since his exposure to the disease in Leyte (approximately 2 years) he had been admitted to 4 army hospitals for similar, recurring complaints of abdominal cramps, constipation, low back pain, weight loss and slight general impairment of health. The symptoms were attributed to *E. histolytica* which was found in Leyte and thoroughly overtreated. The irregular eosinophilia, varying from 6 per cent to 27 per cent (average 16 per cent), and slight fever were the only findings in many studies on the wards and in the laboratory of this hospital. Numerous examinations of stools in other hospitals, and in this one, were negative for *E. histolytica* and other parasites. The eosinophilia was considered a most unlikely result of chronic amebiasis and after 3 proctoscopic specimens of stool were negative for ova of *S. japonicum*, a snip of the mucosa high in the rectum was taken for examination on January 7. It contained several ova of *S. japonicum*. Treatment with Fuadin began January 11 and continued for 16 doses every 2 days. The first dose was 1.5 ml., the second 3.0 ml., and the remaining doses were 5.0 ml. (total dosage—78.5 ml.). During the period of treatment (to February 10) the per cents of eosinophils plateaued at a moderately high per cent. Eight counts varied from 18 per cent to 28 per cent and averaged 24 per cent. Improvement was insufficient. Beginning March 12 and ending April 5 intravenous 0.5 per cent tartar emetic was given. The first dose was 8 ml. and every 2 days thereafter it was increased 4 ml. until the dosage was 28 ml.; 12 more 28-ml. doses were given on alternate days (total dosage—444 ml.). He gradually improved thereafter. The eosinophil per cents ranged irregularly between 4 and 19 after treatment with Fuadin. The last count, on May 1, was 9 per cent. Six months after discharge he appeared in good health and spirits which was in contrast to his slight wasting and truculence while a patient. He had gained 20 pounds of weight. At the present time, nearly eight years after discharge, he reports that he has been entirely well.

A review of the hematological findings of the patients with schistosomiasis admitted to the 118th General Hospital in Leyte revealed that clinical relapse after treatment was, as a rule,

preceded or accompanied by a rise in per cent of eosinophils above 15. This was found in the present case. Successful treatment was followed usually by an irregular return to 0 per cent—6 per cent eosinophils. A return to normal did not occur in this case during the period of observation.

The final resort to the removal of a piece of the rectal mucosa for biopsy was prompted by the work of Johnson and Berry (1945). Taking a cue from Faust and Meleney (1924), who described yellow foci of ova deposition in the mucosa of the colons of dogs, Johnson and Berry found yellow mucosal nodules containing the ova in 42 out of 63 (67 per cent) sigmoidoscopic examinations on schistosomiasis patients on Leyte. Billings and associates (1946), Carroll (1946) and Winkenwerder and associates (1946) describe other findings of the Leyte schistosomiasis. Carroll described fatal schistosomiasis of the brain.

Ascariasis: No infestation acquired while in the armed forces is likely to persist in veterans unless occurring 1 year before a search is made owing to the relatively short life cycle. (See table 6). This circumstance did not obtain for the 8 cases in this hospital, and therefore, they were infested locally. No instance of clinical infection was noted in the 8 patients. Of some interest is the visualization of the parasites in the small intestine of 1 patient by radiographs following barium. Similar observations have been described by Garland (1945), Weir (1946), Lofstrom and Koch (1947), Etter and Cross (1953), and Kean (1953). In Kean's case a worm ingested barium and was, therefore, startlingly demonstrated in the radiograph.

III. MALARIA

Several aspects of tables 1 and 3 are worthy of comment. The absence of malaria in patients in this hospital in the years 1949 and 1950 apparently signified the disappearance of malaria contracted during World War II, either as a result of treatment or attainment of a full span of life, or both. The absence of malaria in veterans

TABLE 6
Parasitocidal Agents

Parasites	Drugs of Choice	Efficacy
<i>Protozoa</i>		
1. <i>Endamoeba histolytica</i>		
a. Intestinal		
Chronic	Carboson Emetine Aureomycin	Moderately* to highly† effective
Acute	Carboson Chloroquine	
b. Liver	Emetine	
c. Lung	Chloroquine Emetine	
2. <i>Giardia lamblia</i>	Atabrine	Highly effective
<i>Helminths</i>		
1. <i>Ascaris lumbricoides</i>	Hexylresorcinol (Caprokol) by Sharp and Dohme	Moderately to highly effective
2. Hookworm	Hexylresorcinol	<i>N. americanus</i> —moderately to highly effective
	Tetrachlorethylene	<i>A. duodenale</i> —moderately effective (often many treatments required)
3. <i>Trichuris trichiura</i>	Oral hexylresorcinol plus enema of hexylresorcinol	Unsatisfactory to moderately effective
4. <i>Strongyloides stercoralis</i>	Gentian violet (enteric coated)	Unsatisfactory but best method available
5. <i>Enterobius vermicularis</i>	Gentian violet (enteric coated)	Unsatisfactory but best method available
6. <i>Taenia saginata</i>	Aspidium (oleoresin)	Moderately effective
7. <i>Hymenolepis nana</i>	Aspidium (oleoresin)	Moderately effective
8. Hydatid cyst	(Surgery)	Frequent cures
9. <i>Schistosoma</i>		
a. <i>S. japonicum</i>	Potassium antimony tartrate Fuadin	Moderately to highly effective
b. <i>S. mansoni</i>	Fuadin or potassium antimony tartrate	
c. <i>S. haematobium</i>	Fuadin	

* Moderately—treatment, as a rule, must be repeated to be successful.

† Highly—one treatment, as a rule, is successful.

in Halloran Hospital, Staten Island, N. Y., in the years 1949 and 1950 was reported by Kean (1953). All Korean veterans admitted to this hospital were examined for malaria. The high incidence (48.3 per cent) of malaria in Korean veterans is interesting in regard to the observation of Archambeault (1954) that chloroquine is an excellent suppressive drug. Comparison of the suppressive values of atabrine and chloroquine is precluded in this study owing to unlike conditions of the two groups of patients. There is substantiation of the conclusion of Archambeault that chloroquine is unsatisfactory for treatment and, with him and Coggeshall (1952),

that primaquine is highly satisfactory. Arnold and co-workers (1954) state that the Korean strain of *P. vivax* is similar to strains of *P. vivax* in other countries in the temperate zone and that the disease is believed to terminate spontaneously at or about 18 months. This natural duration of the Korean malaria (*P. vivax*) of 18 months, approximately, is far less than the apparent natural duration of approximately 3½ years of malaria (*P. vivax*) of World War II.

TREATMENT

In a general way, specific treatment for diseases caused by the intestinal parasites pres-

ently dealt with are shown in table 6 and, for malaria (*P. vivax*), therapy is discussed above. Information on specific treatment is included in several of the preceding separate discussions of the parasitic diseases. The larger part of the information regarding therapy was obtained from the books by Belding (1952) and Grollman (1954). Treatment for amebiasis was determined mainly by the experience of others, including Porter (1953), and Faust (1954). Emetine, owing to its toxic nature, is the second choice for treatment even though it may be equally or even more effective than are the other drugs included in table 6.

Specific treatment for parasitic diseases provided, as a rule, little more than temporary interruption unless the treated individuals are freed from exposure to reinfection. The effectiveness of the practice of public and personal hygiene determines largely the incidence of reinfection as it does the original infection. In tables 4 A and 4 B, the differences in the degree and effectiveness of hygiene is reflected directly in the health of the individuals surveyed. A brief statement of the agents and methods of transmission of the parasitic diseases dealt with presently will conveniently call to mind information which is now pertinent to the statements which follow:

Infestation by ingestion of cysts—amebiasis; giardiasis.

Infestation by penetration of skin by larvae—uncinariasis; strongyloidiasis.

Infestation by penetration of skin by cercaria—schistosomiasis.

Infestation by ingestion of ova—ascariasis; enterobiasis; hymenolepiasis; echinococcosis; trichuriasis.

Infestation by ingestion of *Cysticercus bovis* (of beef)—taeniasis.

Infestation by injection of sporozoites (anopheline mosquito) in the skin.

Recalling this information when confronted with a person harboring parasites, the breaks in hygiene are easily recognized. For instance:

Harboring of hookworms and *S. stercoralis* implies exposure of the skin to infested wet ground. The simple wearing of shoes and keeping the body off the infested ground will largely prevent reinfections after curative treatment. Other instances are the faulty personal and family hygiene of people with *E. vermicularis*, and "dooryard" fouling by people with *A. lumbricoides*. Less easily determined, however, are the breaks in hygiene related to *E. histolytica*. Treatment should include instructions concerning public and personal hygiene.

In tables 4 A and 4 B, one can see the frightening results of hygiene little better than the hygiene of the animals which live under the raised huts (Group 2) and the good results of highly developed sanitation in an ordinary large American city (Group 13). Proof, that the low economic status and climate not conducive to the practice of hygiene, which prevail, as a rule, in areas of high incidence of parasitic disease, are surmountable obstacles in improvement of public health, was given by the redoubtable Senegalese civilians-turned-soldiers. Using good "native" sanitation they had a remarkably low incidence of infestation by pathogenic parasites even after an incredible "walk" from French Equatorial Africa to Egypt and thence to Italy by transport. The moderate overall incidence (39.8 per cent) of the Senegalese is contrasted to the high incidence (88.7 per cent) of the Brazilian civilians-turned-soldiers. The absence of nematode infestations, except that due to *E. vermicularis*, in the Alaskan natives is probably the result of fully clothing the body for warmth and soil unfavorable for harboring infective parasitic forms, than it does for personal hygiene because the parasite most closely identified with faulty personal and family hygiene, the pin worm, is highly infestive. These are some of the more glaring examples of the effect of hygiene on public health in tables 4 A and 4 B. If one could state, and it seems not too incorrectly, that the incidence survey of the patients of the Veterans Hospital, Fort Howard, accurately indicates the

incidence of infestation of the residents of the state of Maryland, then an incidence of parasitic infestation of 2.3 (plus) per cent is not too gratifying.

Several aspects of infestation affect the efficacy of treatment. Any intestinal parasite which penetrates or attaches itself to the surfaces of the body is, actually, pathogenic. Pathogenicity, providing the parasites are equally poisonous and the hosts equally resistant, depends on the outcome of the competition of the masses of parasites with the host for nourishment, the physical interference of the masses of parasites with the absorption and utilization of nourishment by the host, and the obstruction of the intestines by masses of parasites. Certain parasites, moreover, are toxic in small numbers whereas others become toxic only when infestation is massive. One of the most irritating components of all parasites is the mucoid secretion by mature ova of *Schistosomas* because this minute amount of substance is responsible for intense tissue reactions. Far less intense reactions are found about *S. stercoralis* in the intestinal mucosa whereas the tissue reactions to the advancing margins of lesions caused by *E. histolytica* appear disproportionately greater than is the toxicity of the infection in a given lesion (see Case 3). A parasitic disease is largely the result of the mass of the infecting parasite, which naturally accumulates slowly as a result of repeated infestations adding more parasites than die at the sites of infection. Although heavy single or closely set multiple light infections with explosive outbreaks of disease, such as the hookworm disease in India and Burma and the schistosomiasis in Leyte, or distressing manifestations, such as the filariasis in American troops on the Tonga and Samoa Islands in the Southwest Pacific in 1942, described by Dickson and Huntington (1943), King (1944), Wartman (1944), and Brown, Stifter and Bethea (1946), are of great immediate concern but there is some consolation in the knowledge that the diseases are most severe in

the early stages and then become chronic and, usually, mild until they disappear. The prompt initiation of highly effective practices of public and personal hygiene by the Armed Forces in relation to these outbreaks and the malaria epidemic in New Guinea was one of the great medical achievements of World War II. The success of these and similar public health programs has been reflected in the health of veterans to a degree far greater than is usually appreciated.

The authors wish to express their appreciation for the technical assistance of W. O. Oktavec, Jr., and J. W. Jordan, Jr.

SUMMARY

1. A survey of parasitic infestations in a 491-bed general hospital serving the veterans in the entire state of Maryland in the eight years from 1947 to 1954 is presented.

2. The presented clinical parasitic infections are described and related to the parasitic diseases of troops and natives in the widely scattered portions of the world where American troops have served and are now serving.

3. Amebiasis is discussed in some detail because it is the most serious parasitic disease in the survey. The diagnostic character of amebic exudate is described as viscous, non-stringy, slightly translucent gray and without a particular odor. The diagnostic microscopic appearance of the lesions of amebiasis is described.

4. Therapy, including instruction of patients in hygiene, is discussed for each of the diseases encountered in the survey.

5. An effort has been made to alert the physicians in Maryland to the continuing problems referable to parasitic diseases in veterans.

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REFERENCES

1. ANDERSON, H. H., BOSTIC, W. L., AND JOHNSTON, H. G., Amebiasis. Pathology, diagnoses and chemotherapy. Charles C. Thomas, Springfield, Ill., 1953.

2. ARCHAMBEAULT, C. P., Mass antimalarial therapy in veterans returning from Korea. *J.A.M.A.*, **154**: 1411-1415, 1954.
3. ARNOLD, J., ALVING, A. S., HOCKWALD, R. S., CLAYMAN, C. B., DERN, R. J., AND BEUTLER, E., Natural history of Korean vivax malaria after deliberate inoculation of human volunteers. *J. Lab. & Clin. Med.*, **44**: 723-726, 1954.
4. ASH, J. E., AND SPITZ, S., Pathology of tropical diseases. An Atlas. W. B. Saunders, Philadelphia, 1945.
5. BATTACHARJEA, T., GIARDIASIS. A definite disease. *Indian M. Gaz.*, **78**: 91-92, 1943.
6. BELDING, L., Textbook of clinical parasitology. Appleton-Century-Crofts, Inc., N. Y., 1952.
7. BILLINGS, F. T., WINKENWERDER, W. L., AND HARRISON, A. V., Studies on acute schistosomiasis japonica in the Philippine Islands. I. A clinical study of 337 cases with a preliminary report on the results of treatment with Fuadin in 110 cases. *Bull. Johns Hopkins Hosp.*, **78**: 21, 1946.
8. BLOUNT, R. E., Massive hookworm infestation following a single exposure. *Mil. Surgeon*, **106**: 449-452, 1950.
9. BODON, G. R., A case of strongyloides stercoralis infestation. *J. Lab. & Clin. Med.*, **26**: 1608-1611, 1941.
10. BROOKE, M. M., DONALDSON, A. W., AND BROWN, E., An amebiasis survey in a veterans administration hospital, Chamblee, Georgia, with comparison of techniques. *Am. J. Trop. Med.*, **3**: 615-627, 1954.
11. BROWN, T. M., STIFLER, W. C., AND BETHEA, JR., W. R., Early filariasis. *Bull. Johns Hopkins Hosp.*, **78**: 126, 1946.
12. CARROLL, D. G., Cerebral involvement in schistosomiasis japonica. *Bull. Johns Hopkins Hosp.*, **78**: 219-234, 1946.
13. CHANDHURI, R. N., A note on giardiasis with steatorrhea. *Indian M. Gaz.*, **78**: 284-285, 1943.
14. CHAPMAN, B. M., SCHWARTZ, H., AND HAISLIP, D. B., Unusual complications of amebiasis. *Ann. Int. Med.*, **28**: 850-861, 1948.
15. COGGESHALL, L. T., The treatment of malaria. *Am. J. Trop. Med.*, **1**: 124-131, 1952.
16. CRAIG, C. F., AND FAUST, E. C., Clinical parasitology. Lea and Febiger, Philadelphia, 1951.
17. DICKSON, J. G., HUNTINGTON, JR., R. W., AND EICHOLD, S., Filariasis in defence force, Samoan group. *U. S. Nav. M. Bull.*, **41**: 1240-1251, 1943.
18. ELDON-DEW, R., WILMOT, A. J., AND ARMSTRONG, T. G., Fumagillin in amoebiasis. *Lancet*, **265**: 1180-1181, 1953.
19. ETTER, L. E., AND CROSS, L. C., Roentgenographic signs of intestinal parasitic infestation. A case report. *U. S. Armed Forces M. J.*, **4**: 599-601, 1953.
20. FAUST, E. C., AND MELENEY, H. E., Studies on schistosomiasis japonica. *Am. J. Hyg.*, 1924 (Monographic Series No. 3).
21. FAUST, E. C., Amebiasis. Charles C. Thomas, Springfield, Ill., 1954.
22. GARLAND, L. H., Tropical diseases of interest to radiologist. *Radiology*, **44**: 1-13, 1945.
23. GINSBERG, M., AND MILLER, J. M., Abscess of the lung due to endamoeba histolytica. *Maryland M. J.*, **1**: 295-298, 1952.
24. GOLDMAN, M., AND JOHNSON, S., Intestinal parasite surveys in Georgia. *J. Parasitol.*, **38**: 86-87, 1952.
25. GROLLMAN, A., Pharmacology and therapeutics. Lea and Febiger, Philadelphia, 1954.
26. GUNN, H., AND HOWARD, N. J., Amebic granulomas of the large bowel. Their clinical resemblance to carcinoma. *J.A.M.A.*, **97**: 166-170, 1931.
27. HALL, M. C., Study on oxyuriasis. I. Types of anal swabs and scrapers with a description of an approved type of swab. *Am. J. Trop. Med.*, **17**: 445-453, 1937.
28. HITCHCOCK, D. J., Parasitological study on the Eskimos on the Kotzebue area of Alaska. *J. Parasitol.*, **37**: 309-311, 1951.
29. JOHNSON, JR., A. S., AND BERRY, M. G., Asiatic schistosomiasis. Clinical features, sigmoidoscopic picture and treatment of early infections. *War Medicine*, **8**: 156-162, 1945.
30. JONES, C. A., Clinical studies in human strongyloidiasis. I. Semeiology. *Gastroenterology*, **16**: 743-756, 1950.
31. JONES, C. A., AND ABADIE, S. H., Studies in human strongyloidiasis. II. A comparison of the efficiency of diagnosis by examination of feces and duodenal fluid. *Am. J. Clin. Path.*, **24**: 1154-1158, 1954.
32. KATSAMPES, C. P., MCCOORD, A. B., AND PHILLIPS, W. A., Vitamin A. Absorption test in cases of giardiasis. *Am. J. Dis. Child.*, **67**: 189-193, 1944.
33. KEAN, B. H., Parasitic diseases among veterans at Halloran Hospital 1947-1951. *Mil. Surgeon*, **113**: 399-402, 1953.
34. KESSEL, J. F., PARRISH, M., AND PARRISH, G., Intestinal protozoa, helminths and bacteria in Tahiti, French Oceania. *Am. J. Trop. Med.*, **3**: 440-446, 1954.
35. KING, G., Early filariasis and clinical findings: A report of 268 cases in American troops. *Am. J. Trop. Dis.*, **24**: 285-298, 1944.
36. KYLE, L. H., MCKAY, D. G., AND SPARLING, J., Strongyloidiasis. *Ann. Int. Med.*, **29**: 1014-1042, 1948.
37. LEVIN, M. B., Infestation with strongyloides stercoralis. *J. Lab. & Clin. Med.*, **28**: 680-682, 1943.
38. LIEBOW, A. A., AND HANNUM, C. A., Eosinophilia, ancylostomiasis, and strongyloidosis in the South Pacific area. *Yale J. Biol. & Med.*, **18**: 381-403, 1946.
39. LOFSTROM, J. E., AND KOCH, D. A., Diagnosis of ascariis infestation by serial roentgen examination of small intestine. *Am. J. Roentgenol.*, **57**: 449-452, 1947.
40. MCHARDY, G., Incidence of amebiasis. *Gastroenterology*, **25**: 616-617, 1953.
41. MACKIE, T. T., LARSH, J. E., AND MACKIE, J. W., A survey of intestinal parasitic infections in the Dominican Republic. *Am. J. Trop. Med.*, **31**: 825-832, 1951.
42. MAGATH, T. B., Hydatid (echinococcus) disease in Canada and the United States. *Am. J. Hyg.*, **25**: 107-134, 1937.
43. MOST, H., HAYMAN, J. M., AND WILSON, T. B., Hookworm infections in troops returning from the Pacific. *Am. J. M. Sc.*, **212**: 347-350, 1946.

44. ORBISON, J. A., REEVES, N., LEEDHAM, C. L., AND BLUMBERG, J. M., Amebic brain abscess: review of the literature and report of five additional cases. *Medicine*, **30**: 247-282, 1951.
45. PALMER, E. D., A consideration of certain problems presented by a case of strongyloidiasis. *Am. J. Trop. Med.*, **24**: 249-254, 1944.
46. PORTER, R. J., Amebiasis. *Ann. Rev. Microbiol.*, **7**: 273-294, 1953.
47. ROGERS, A. M., AND DAMMIN, G. J., Hookworm infection in American troops in Assam and Burma. *Am. J. M. Sc.*, **211**: 531-538, 1946.
48. SAWITZ, W., ODOM, V. L., AND LINCICUM, D. R., The diagnosis of oxyuriasis. Comparative efficiency of the NIH swab examination and stool examination by brine and zinc sulphate flotation for enterobius vermicularis infection. *Pub. Health Rep.*, **54**: 1148-1158, 1939.
49. SMETANA, E. J., AND OKTAVEC, JR., W. O., Chief Technicians, Clinical Laboratory, Veterans Hospital, Fort Howard, Md. Personal Communication, 1954. (Modified Wright and Giemsa Stains)
50. SODEMAN, W. A., AND ENGLE, R., Amebic granuloma of the colon. *Am. J. Digest. Dis.*, **19**: 363-367, 1952.
51. STEMPIEN, S. J., AND WILKINS, F. B., Amebiasis of the colon simulating obstructing carcinoma. *Gastroenterology*, **16**: 598-601, 1951.
52. STOLL, N. R., LOUGHLIN, E. H., HARRIS, A. H., AND CHENOWITH, JR., B. M., A study of hookworm infection in Navy and Marine personnel on Guam. *Am. J. Trop. Med.*, **26**: 687-698, 1946.
53. STRONG, R. P., Stitts diagnosis, prevention and treatment of tropical diseases. The Blakiston Co., Philadelphia, 1944.
54. SULLIVAN, B. H., AND BAILEY, F. N., Amebic lung abscess. *Dis. Chest*, **20**: 84-96, 1951.
55. WARTMAN, W. B., Lesions of the lymphatic system in early filariasis. *Am. J. Trop. Med.*, **24**: 299-313, 1944.
56. WATT, J. Y. C., AND VANDEGRIFT, W. B., Laboratory observations on the actions of aureomycin, circurin, polymyxins B, D, and E. on endamoeba histolytica. *J. Lab. & Clin. Med.*, **36**: 741-746, 1950.
57. WEIR, D. C., Roentgen diagnosis of ascariasis in alimentary tract. *Radiology*, **47**: 284-286, 1946.
58. WESELMANN, H., Ueber die bedeutung des vorkommens von lamblien im duodenum und im gallenwegssystem. *Deut. Militararzt.*, **8**: 204-207, 1943.
59. WINKENWERDER, W. L., HUNNINEN, A. V., HARRISON, T., BILLINGS, F. T., CARROLL, D. G., AND MAIER, J., Studies on schistosomiasis japonica. 2. Analysis of 364 cases of acute schistosomiasis with report of results of treatment with Fuadin in 184 cases. *Bull. Johns Hopkins Hosp.*, **79**: 406-435, 1946.

MORE SURPLUS PROPERTY SOUGHT FOR HEALTH AND EDUCATION

The AMA Washington Letter, No. 84-8

Chairman John W. McCormack (D., Mass.) is directing a House Government Operations Subcommittee on an investigation of charges that a new Defense Department regulation is preventing distribution of surplus property to health and educational institutions. The regulation requires that certain salable surplus items in the military services be placed in a "capital account," to be sold at prices said to average less than 5% of their acquisition cost. A system for free distribution to health and educational institutions has been in existence for some years, under supervision of the Department of Health, Education, and Welfare. A bill before the subcommittee (H.R. 3322) would amend the present law to:

1. Require all departments to release surpluses if the states and other non-profit agencies want them, and if HEW approves.
2. Remove after one year any restrictions on resale or disposal of surplus property previously acquired, and permit immediate passage of title in future acquisitions.
3. Allow for unrestricted transfer of surplus property ownership among federal and state agencies.

The bill is sponsored by Mr. McCormack, who said he had received telegrams from the governors of six states supporting the measure—Kansas, Nevada, Michigan, Massachusetts, Maine and Florida.

Component Medical Societies

ALLEGANY-GARRETT COUNTY MEDICAL SOCIETY

LESLIE E. DAUGHERTY, M.D.

Journal Representative

The regular business meeting of the Allegany-Garrett County Medical Society was held on Friday, January 28th, in the basement of the Memorial Hospital Nurses Home. Fifteen members were present.

The meeting was called to order by the president, Dr. Frank Harrat. Minutes of the previous meeting were read and approved and a report given by the treasurer.

Old business was discussed, including the proposed Woman's Auxiliary and no action was taken. Also discussed was the method of collection of dues.

The annual election of officers was held, with the following being elected for the year 1955: Dr. James T. Johnson, *President*; Dr. Alfred VanOrmer, *Vice-President*; Dr. Benedict Skitarelic, *Secretary*; Dr. Leo Ley, *Treasurer*.

Dr. Emmett Jones was elected Censor, for three years, Dr. Frank Harrat and Dr. Royce Hodges were elected Delegates, Dr. Leland Ransom and Dr. Leslie E. Daugherty elected Alternates, and Dr. Daugherty was elected to remain the Journal Representative.



DR. LEO LEY, *Treasurer*; DR. BENEDICT SKITARELIC, *Secretary*; DR. JAMES T. JOHNSON, *President*

MEDICAL MEN ENDORSE HEART PROGRAM IN

ALLEGANY-GARRETT COUNTY

At a recent meeting of the Advisory Board of the Allegany-Garrett County Heart Association, Dr. William F. Williams and Dr. William A. VanOrmer were elected co-chairman.

Members of the Medical Advisory Board were as follows; Dr. H. W. Eliason, Dr. James T. Johnson, Dr. Arthur F. Jones, Dr. Leland B. Ransom, Dr. George J. Richards, Dr. Benedict Skitarelic, Dr. W. A. VanOrmer, Dr. S. G. Weisman, Dr. Richard J. Williams and Dr. W. F. Williams.

Organization plans provide a complete and thorough study of any patient referred to the Heart Association by the family physician, so that his individual case is reviewed. The Work Classification Unit determines if he is able to do any productive work and if so, the nature of that work. If the patient is not trained in a field where he could be active, the Heart Association undertakes to train him, or to have him trained, so he can become self supporting and a productive citizen.

The program for recreation, for children with heart disease was also approved. This program involves craft work, home study and other activities, supervised by a medical social worker or recreational counselor who works with the patients in their own homes.

BALTIMORE CITY MEDICAL SOCIETY

CONRAD ACTON, M.D.

Journal Representative

The Executive Board at the 25 January meeting took up the Government Re-insurance Program and referred it to the Committee on Public Medical Education for study, interpretation, and report.

An invitation to the Southern Medical Association to hold its meeting for 1958 in Baltimore was approved.

The increase in the cost of physician's liability insurance was brought up. The possibility that a

group insurance program might be less expensive seemed reasonable and the treasurer was directed to investigate.

Approval of the 'new' (contemplated) adoption law for children was voted, if a section (C) that would allow a third party to participate in the placement were deleted. The Executive Board felt that adoptions should be handled entirely by an agency. This is in some contrast to the stormy meeting at which in 1953 the adoption law was wholeheartedly berated by the Society. It is to be hoped that the "new" (1955?) adoption law will be widely published so that doctors and lawyers can be conversant with it. Perhaps the Medico-Legal Committee of the Faculty should have a symposium on this law if passed.

A Special Meeting of the Baltimore City Medical Society was held Monday, 31 January to consider Civil Defense. This was in conformity with the Resolution of the State Faculty that each component society devote the scientific part of one meeting to Civil Defense. As the regular meeting programs had been set up prior to receipt of this Resolution, a Special Meeting was held.

Dr. Huntington Williams, Director of the Baltimore City Health Department as well as Chief of Medical Services, Civil Defense, Baltimore City, and Dr. William S. Stone, Director of Medical Education and Research at the University of Maryland, cooperated in securing Dr. John Raker as speaker. Dr. Raker, at present Director of the Surgical Service at the Pennsylvania Hospital, Philadelphia, presented an analysis of the functioning of medical services in an actual disaster. He had been Chairman of a Team for Study of the Worcester, Massachusetts, Disaster of 6 June 1953. He and others from the Massachusetts General Hospital had been selected by the National Research Council to make the study. A large and appreciative audience followed his very lucid detailing of what happened in this representative community when a 'limited' disaster struck. Many must have left the meeting wondering, "Could we do as well?" He certainly demonstrated that all disasters are not the same and that each needs to be handled in its own way. One plan will not meet all disasters—nor should we beat our brains out trying to find one that will. Prior planning pays—even a little bit—and he showed how. The meeting also seemed to

provide outlets for many physicians who are anxious to do their part in the Civil Defense requirement, but have felt thwarted in trying to come to grips with anything that they felt was adequate direction. The Chairman of the Program Committee, not being part of the Civil Defense group, was glad to direct inquirers straight to Dr. Williams.

The Regular Meeting of the City Society for February was held on Friday the Fourth. Dr. Allen O. Whipple, Emeritus Professor of Surgery, Columbia College of Physicians and Surgeons, New York City, spoke on "The Circulation of the Spleen in the Living Animal and its Relation to Certain Splenopathies in Man." Although Dr. Whipple clearly described his research in unravelling the mysteries of splenic circulation in mice and reconciled the divergent theories, the meeting was really a testimonial to Dr. Whipple—the surgeon. Discussion of his paper, by Baltimore's leading surgeons, turned into descriptions of the part Dr. Whipple has played in the development of modern vascular procedures and in the lives of his admirers. It was heart-warming to hear such unstinted praise come so spontaneously from so many.

CARROLL COUNTY MEDICAL SOCIETY

WILLIAM B. CULWELL, M.D.

Journal Representative

The January Meeting of the Carroll County Medical Society was held on January 19, with the guest speaker, Dr. William Lumpkin, who discussed Nyloxan Therapy of Arthritis.

Officers for the year 1955 are as follows: Dr. Wilbur H. Foard, Manchester, *President*; Dr. G. Allen Moulton, Westminster, *Vice-President*; Dr. William B. Culwell, Mount Airy, *Secretary, Treasurer*, and *Journal Representative*; Dr. R. S. McVaugh, Taneytown, *Delegate*; Dr. M. E. Robertson, New Windsor, *Alternate*; Dr. W. G. Speicher, Westminster, Dr. James T. Marsh, Westminster, and Dr. M. E. Robertson, New Windsor, *Board of Censors*.

Dr. Walton E. Stevens, Taneytown, resigned from the Society December 1954, to take residency training in Philadelphia.

Dr. Robert G. Steele, Taneytown, was accepted as a new member of the County Society.

Dr. J. Stanely Grabill died suddenly, January 30, after thirty-two years practice in Carroll County.

CECIL COUNTY MEDICAL SOCIETY

M. H. SPRECHER, M.D.

Journal Representative

Dr. Richard C. Dodson of Rising Sun was elected President of the Cecil County Medical Society at its recent election of officers, Dr. Wallace Obenshaine of Cecilton was elected Vice President, and Dr. Klaus Heubner of North East, the Secretary-Treasurer.

Dr. Dodson advanced to the Presidency from the position of secretary-treasurer, a position which he has held since 1930. Continuous service to the Society in this capacity for 25 years is recognized by the State Society, and he is one to be honored by receiving the Special Award.

The Society recently heard a paper presented by the new president covering the 39 years that he has been head of the Department of Obstetrics of the Union Hospital, Elkton. The management of 3,400 births with two maternal deaths, and sections numbering 24 with no fatalities were recorded. He is a member of the Obstetrical and Gynecological Society of Maryland.

Dr. Dodson has practiced in Rising Sun since 1916 and resides there with his wife, Ann. He is associated with his son, Richard, Jr., in the Rising Sun Pharmacy and as another duty is Deputy Medical Examiner for the county. Civic activities include the present term as Councilman for Rising Sun and membership in the Lions Organization of the town.

The Society is now planning a meeting with an outstanding speaker at which the wives of the members, the dental profession, the pharmacists and the public health and hospital personnel will be present.

MONTGOMERY COUNTY MEDICAL SOCIETY

MAYNARD I. COHEN, M.D.

Journal Representative

The February meeting of the Montgomery County Medical Society was held in the auditorium of the County Office Building on February 15, 1955. The subject of the meeting was "Allied Services Available to the Physician and his Patient in Montgomery

County." Participating in the program were the Cancer Society, Cerebral Palsy Association, Health Fund, Mental Hygiene Clinic and Society, Society for Crippled Children and Adults, Tuberculosis Association, Social Service League, County Health Department and Welfare Board. These agencies service to help families in emergency needs which exceed their normal resources. Members of the Society raised questions relative to their particular patient interests and presented cases involving their relationships with these agencies.

The following new members were welcomed to the Society: active, Doctors Charles Jerome Everding, Veronika Troost, and Gilcin Finley Meadors, Jr.; affiliate, Dr. John B. Umhau, Jr.

The following message from Dr. Hare, President of the Society, was summarized from a statement of the Secretary of the Medical and Chirurgical Faculty of the State of Maryland.

"At the meeting of the Council on November 9, 1954, there was a discussion and action regarding the proposed amendment to the Child Care and Placement Law regarding Adoption Procedure. . . . It was moved, seconded and carried that the Council of the Medical and Chirurgical Faculty give its endorsement to the proposed amendment to the Child Care and Placement Law as proposed by the Governor's Commission with the addition of the potentiality of the amendment whereby the alternative of Paragraph 'C' might be elected by any county or counties."

The final bill adopted by the Governor's Commission is as follows:

- "1. Any institution, agency or society, which acts as a child placement agency, shall obtain a license from the State Department of Welfare.
2. A person may not act as a placement agency or place a child except
 - (a) The placement of a child with a person or persons related to the child by blood or marriage shall require no license;
 - (b) The placement of a child by the child's natural parent or parents provided the placement was made directly to such person or persons without the intervention of any person or persons aiding or abetting the placement, and further provided that prior to the placement of the child a peti-

tion for adoption has been filed in a Court of competent jurisdiction and the consent of the Court has been obtained to the adoption."

"We (the Council) wish to particularly call to the attention of your county that if you so desire you have the privilege of withdrawing from this Law (House Bills 23 and 24), providing that you adopt item 'C' of the proposed bill which reads as follows:

'A person who aids, abets or arranges for the placement of a child for adoption with a person or persons not related to the child by blood or marriage shall not be required to obtain a license, provided that prior to the placement of the child a petition for adoption has been filed setting forth, in addition to the regular requirements of such proceedings, the following:

1. The reason why such person aided, abetted or arranged the adoption and acts performed by such person in connection therewith;
2. The extent of such person's knowledge about the background of the child and the adopting parents; and
3. What, if any, sums were paid such person for aiding, abetting or arranging the adoption.'

"If your Society wishes to be exempt from the full coverage of this proposed law, you should contact your State legislative representative."

WASHINGTON COUNTY MEDICAL SOCIETY

SIDNEY NOVENSTEIN, M.D.

Journal Representative

The first regular quarterly meeting of the Washington County Medical Society was held at the Alexander Hotel, Thursday, January 27, 1955, with Dr. Archie Robert Cohen presiding.

The guest speaker was Mr. Eli Baer, President of the Maryland Chapter of the Federal Bar Association. His subject was "Your Income Tax for 1954." Various aspects of the new code were discussed and elucidated.

Installation of officers for 1955 was made and is as follows: Dr. S. E. Young, *President*; Dr. L. A. Hoffman, *Vice-President*; Dr. E. F. Poole, *Secretary and Treasurer*; Dr. J. H. Hornbaker, *Board of Censors*; Dr. R. vL. Campbell and Dr. O. D. Sprecher, *Delegates*; Dr. W. T. Layman and Dr. G. W. LeVan, *Alternates*.

The Society now has an enrollment of eighty-one members.

ARTIFICIALLY CONCEIVED CHILD IS ILLEGITIMATE*

In a declaratory judgment entered without opinion, the Superior Court of Cook County, Illinois, rules that a child conceived by heterologous artificial insemination is illegitimate. (Doornbos vs. Doornbos, 12/13/54)

"Heterologous" artificial insemination is accomplished with a specimen of semen obtained from a third-party donor rather than from the mother's husband. According to the court, even if the husband consents to such insemination, it "is contrary to public policy and good morals and constitutes adultery on the part of the mother."

Since there is no opinion, it is not possible to ascertain how the court supplies the element of "sexual intercourse" which lexicographers find essential to a definition of adultery.

The court has no quarrel with "homologous" artificial insemination—that accomplished with semen obtained from the husband. (See Court Decisions: Domestic Relations).

* Submitted by courtesy of Mr. G. C. A. Anderson. Reprinted by courtesy of *United States Law Week*, January 4, 1955.

Necrology

A. S. CHALFANT, M.D., *Chairman*

Memoir Committee

William Ralph Bender, Ph.G., M.D.

1887-1954

Dr. Bender was born in Hagerstown, Maryland, July 16, 1887; attended the University of Maryland, 1902-1906; received his Ph.G. and M.D. degrees from the University of The South, Sewanee, Tennessee in 1908 with special training in Diseases of

the Skin, Diseases of Children, Gynecology and Obstetrics, and Surgery. Dr. Bender interned at the Union Memorial Hospital in Davis, West Virginia and practiced in Charlestown, West Virginia from 1910 to 1912. He returned to Hagerstown to practice in 1912 until his death December 29, 1954, at the Washington County Hospital. Dr. Bender served as Track Physician at the Hagerstown Race Track for many years.

DOCTOR RATIO CALLED BAR TO MORE DEPENDENT MEDICAL CARE

The AMA Washington Letter, No. 84-6

Secretary of Navy Thomas in testimony before the House Armed Services Committee declared that until the ratio of physicians to personnel is increased, the Navy will not be able to improve on its program of medical care for servicemen's families. Mr. Thomas, a former Assistant Secretary of Defense, was asked by Rep. Clyde Doyle (D., Calif.) what the service was doing to correct "inadequate" dependent medical care. The Secretary replied: "... we are frozen to 3.26 doctors per 1,000 troops and that is our difficulty. Until we get that raised, we will not be able to do any better than we are doing now." The Army ratio has been set at 3.0 and the Air Force at 2.9. The ratios were ordered by Secretary of Defense Wilson with a deadline of June, 1954.

The committee has not yet taken up the dependent medical care bill but will consume considerable time on military pay raises, the new modified reserve training program and extension of the regular draft. The doctor draft extension likewise is far down on the hearing list.

Health Departments

MARYLAND STATE DEPARTMENT OF HEALTH

Planning for 1955 Poliomyelitis Vaccine Inoculations: Medical Advisory Com- mittee Appointed

It became apparent in late December that State Health Departments nationwide would have the responsibility of administering the new poliomyelitis vaccine to first and second grade school children if and when the material is licensed by the National Institutes of Health.

MEDICAL ADVISORY COMMITTEE

About the middle of December 1954 the Director of the State Health Department took steps to appoint a Medical Advisory Committee to work with the Department in planning for this large scale undertaking in preventive medicine. The Medical and Chirurgical Faculty of Maryland, Maryland Chapter of the Academy of Pediatrics and Maryland Academy of General Practice were all invited to name official representatives to this Committee. In addition several physicians were appointed to represent the State, City, and County Departments of Health. Members of the Committee are:

- Dr. Harry D. Bowman, Medical and Chirurgical Faculty of Maryland
- Dr. J. Edmund Bradley, Medical and Chirurgical Faculty of Maryland
- Dr. William C. Morgan, Medical and Chirurgical Faculty of Maryland
- Dr. Alexander J. Schaffer, Maryland Chapter, American Academy of Pediatrics
- Dr. Lauriston L. Keown, Maryland Academy of General Practice
- Dr. Robert W. Farr, Maryland Academy of General Practice
- Dr. Jean R. Stifter, Maryland State Health Department
- Dr. Huntington Williams, Baltimore City Health Department

Dr. J. Howard Beard, County Health Departments

Dr. Bradley will serve as Chairman of the group.

NATIONAL ADVISORY GROUP

On December 22, 1954 Dr. Hart E. Van Riper announced that the National Foundation for Infantile Paralysis had invited official representatives of five national professional societies and health agencies, most directly concerned with the 1955 poliomyelitis vaccine program to meet in New York City. The groups represented at this meeting which was held on January 10, 1954 were the American Medical Association, American Academy of Pediatrics, Association of State and Territorial Health Officers, American Public Health Association, U. S. Department of Health, Education, and Welfare, and The National Foundation for Infantile Paralysis.

Some of the points agreed upon at this meeting include:

If and when licensed by the National Institutes of Health the vaccine will be supplied by the National Foundation to State Health Officers in amounts sufficient to provide for the vaccination of

- a) Children who participated in the 1954 vaccine field trial but who did not receive vaccine at that time.
- b) All children enrolled in the first and second primary grades of all public, private, and parochial schools in the continental United States, Alaska, and Hawaii in the Spring term of 1955.

The plan of administration of the vaccine will be the administrative responsibility of the State Health Officer and will be worked out by him in cooperation with the State Medical Society and State Education officials.

The children in the first and second grade of primary schools were selected for the program because the incidence of paralytic poliomyelitis is higher in this group and their accessibility as organized units within the schools, keeping in mind the limitations on the amount of vaccine available.

It is expected that additional vaccine, equivalent or greater in amount than that contracted for by the National Foundation, will be obtainable through usual commercial channels for the use of private physicians for their patients.

Vaccine for use in 1955 will be administered on the same dosage schedule as was followed in the 1954 field trial, namely 1 cc. of vaccine in each of the three doses, given intramuscularly, the second

inoculation one week after the first and the third inoculation four weeks after the second.

R. H. Riley

Director

PRESIDENT HONORED FOR HIS INTEREST IN MEDICAL EDUCATION

The AMA Washington Letter, No. 98

For his demonstrated interest in medical schools, and his efforts to bring them financial support from non-governmental sources, President Eisenhower has been honored with the first Frank H. Lahey award. The award is a memorial to the late Dr. Lahey of Boston, past president of the AMA, who was a leader in the movement to keep medical schools solvent without federal aid. The presentation was made at the White House by S. Sloan Colt of New York, president of the National Fund for Medical Education. It was sponsored by the American Medical Association and the Association of American Medical Colleges, as well as the Foundation.

The National Fund collects money from non-government sources for distribution to medical schools "with no strings attached." While he was president of Columbia Mr. Eisenhower was largely responsible for getting the fund under way.

The American Medical Association, state societies and individual physicians are heavy contributors.

In accepting the award, the President said he believes medicine "is one profession we don't want to get under the dead hand of bureaucracy." He declared: "Quite naturally, I am very proud to receive an award from such an Association, from such a group. There is an added distinction because it bears the name of one of our greatest professionals and our greatest citizens. On the other hand, Mr. Colt, I rarely felt quite so unworthy of receiving an award because my part on the organization of this National Fund was really getting someone else to do the work. It would be far more fitting this morning if I were presenting this to you, because you have been President of the Association from the beginning. But I can say this: I don't know of any group that is doing more necessary and worth-while work than making certain that our medical schools have ample funds from private sources to keep running, because this is one profession we don't want to get under the dead hand of bureaucracy."

Present at the White House ceremony, in addition to Mr. Colt, were Mrs. Lahey, Dr. Walter B. Martin, president of the AMA, and Dean Vernon H. Lippard of Yale Medical School, who represented the medical schools.

STATE OF MARYLAND DEPARTMENT OF HEALTH
MONTHLY COMMUNICABLE DISEASE REPORT

Case Reports Received during 4-week Period, March 4-31, 1955

	CHICKENPOX	DIPHTHERIA	GERMAN MEASLES	HEPATITIS, INFECT.	MEASLES	MENINGITIS, MENINGOCOCCUS	MUMPS	POLIOVELLITIS, PARALYTIC	POLIOVELLITIS, NON-PARALYTIC	ROCKY MT. SPOTTED FEVER	SORE THROAT INCL. SCARLET FEVER	TYPHOID FEVER	UNDULANT FEVER	WHOOPING COUGH	TUBERCULOSIS, RESPIRATORY	SYPHILIS, PRIMARY AND SECONDARY	GONORRHEA	OTHER DISEASES	DEATHS Influenza and Pneumonia
Total, 4 weeks																			
Local areas																			
Baltimore County.....	50	—	16	1	20	—	11	—	—	—	17	—	—	2	14	—	5	—	6
Anne Arundel.....	22	—	1	—	13	—	3	—	—	—	9	—	—	—	9	—	1	—	1
Howard.....	2	—	—	—	—	—	—	—	—	—	6	—	—	—	—	—	—	—	—
Harford.....	2	—	—	1	1	—	1	—	—	—	8	—	—	—	3	—	1	—	—
Carroll..	4	—	—	—	1	—	—	—	—	—	7	—	—	—	—	—	—	—	2
Frederick.....	9	—	—	4	14	—	42	—	—	—	64	—	—	—	6	—	3	—	1
Washington.....	2	—	—	1	—	—	3	—	—	—	—	—	—	2	12	—	—	—	2
Allegany.....	6	—	—	—	1	—	3	—	—	—	14	—	—	1	1	—	—	—	6
Garrett.....	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	a-1	—	—
Montgomery.....	37	—	3	8	66	1	7	—	—	—	123	—	—	1	8	—	6	—	2
Prince George's.....	12	—	3	2	33	1	10	—	—	—	23	—	—	1	15	—	1	—	5
Calvert.....	—	—	—	3	—	—	—	—	—	—	—	—	—	1	1	—	1	—	—
Charles.....	—	—	—	—	6	—	—	—	—	—	—	—	—	—	1	—	1	—	—
Saint Mary's.....	5	—	3	2	6	—	13	—	—	—	59	—	—	—	1	—	—	—	1
Cecil.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	—	2
Kent.....	2	—	1	1	3	—	—	—	—	—	15	—	—	—	1	—	—	—	1
Queen Anne's.....	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
Caroline.....	1	—	—	—	—	—	5	—	—	—	1	—	—	5	3	—	3	—	—
Talbot.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dorchester.....	2	—	—	—	—	—	—	—	—	—	—	—	—	—	2	1	6	—	—
Wicomico.....	12	—	1	1	—	—	56	—	—	—	28	—	—	—	1	1	4	—	1
Worcester.....	3	—	—	—	—	1	2	—	—	—	3	—	—	—	3	—	—	—	1
Somerset.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Counties.....	173	0	28	24	164	3	156	0	0	0	378	0	0	13	83	2	33	—	31
Baltimore City.....	191	0	34	2	84	0	80	0	0	0	61	0	0	16	97	9	423	a-3 p-1 w-1	22
State																			
March 4-31, 1955.....	364	0	62	26	248	3	236	0	0	0	439	0	0	29	180	11	456	—	53
Same period 1954.....	546	0	37	94	2378	7	378	1	0	0	245	1	1	57	180	14	397	—	63
5-year median.....	565	2	125	—	935	10	308	2	—	0	218	2	2	41	213	22	491	—	77
Cumulative totals																			
State																			
Year 1955 to date.....	1181	1	134	114	456	9	645	2	1	0	1481	0	0	112	476	35	1688	—	243
Same period 1954.....	1837	4	96	327	5144	18	1290	3	0	0	653	1	1	254	548	57	1656	—	268
5-year median.....	1569	11	189	—	2220	27	830	5	—	0	616	5	7	179	610	75	1695	—	223

a = amebiasis.

p = psittacosis.

w = Weil's disease.

BALTIMORE CITY HEALTH DEPARTMENT

Obstetrical Hospital Shortage Is Acute

The rapid growth of the suburban section relative to the central city in the Baltimore metropolitan area sets up many complex problems not the least of which concerns the utilization and adequacy of hospital facilities. Due to the fact that the City Health Department is responsible for the registration of all births which occur in the city whether to residents or nonresidents, the Statistical Section is able to study the manner in which obstetrical inpatient facilities are utilized by the population in the metropolitan area.

The changing nature of the proportions of residents of the city and of the counties of Maryland utilizing the obstetrical facilities in the seventeen general hospitals located within Baltimore is shown in the accompanying table.

LARGE UPSWING IN BIRTHS

Year	Total Livebirths Recorded	Births in Hospitals		
		Total	City Resident	Non-resident
1935	13,641	8,346	7,047	1,299
1940	16,478	13,164	10,410	2,754
1945	22,936	19,729	14,622	5,107
1950	28,887	27,104	19,609	7,495
1953	32,532	31,447	21,673	9,774
1954 (Est.)	34,400	33,500	22,700	10,800

Several features of this data are worth noting. Since 1935, there has been a four-fold increase in the number of births occurring in hospital. Whereas

the nonresident proportion of hospital births was 16 per cent in 1935, it is now of the order of 33½ per cent. That is, one out of three babies delivered in hospitals in Baltimore City is born to a family where residence is probably in the suburban county area.

Although no exact figures are at hand relative to the growth of obstetrical facilities within the period covered in the foregoing table, it is reasonably certain that the number of beds available for obstetrical service has in no way paralleled the growth in the demand for such facilities. As a matter of fact, after careful study it could well be that there has been no increase at all since 1935 in the numbers of such beds. As a result, the length of stay for postpartum care has been materially reduced and it is no longer an uncommon event for a mother to leave a hospital within forty-eight hours of delivery.

DANGER AHEAD

There is a limit beyond which further reduction in length of stay must be regarded as dangerous to the health of the mother and newborn child. It should be known by all that the Baltimore infant and maternal mortality rates for 1954 both rose over rates for prior years. It will be necessary to consider carefully the future hospital needs of this rapidly growing metropolitan area if we are to avoid a decline in quality of care in the face of mounting demand for limited facilities.

Huntington Williams, M.D.

Commissioner of Health

ANNUAL OTOLARYNGOLOGIC ASSEMBLY

The Department of Otolaryngology, University of Illinois College of Medicine, announces its Annual Assembly in Otolaryngology from September 19 through October 1, 1955. This Assembly will consist of two parts.

Part I. September 19 through September 24, 1955, will be devoted to surgical anatomy of the head and neck, fundamental principles of neck surgery and histopathology of the ear, nose and throat. This week will be under the personal direction of Maurice F. Snitman, M.D.

Part II. September 26 through October 1, 1955, will be devoted entirely to lectures and panel discussion of advancements in otolaryngology. The chairman of this section will be Emanuel M. Skolnik, M.D.

Registration is optional for one or both weeks.



Blue Cross - Blue Shield



BLUE CROSS IN 1954, A PROGRESS REPORT

R. H. DABNEY*

Blue Cross paid \$12,783,042 in hospital care benefits in 1954, the seventeenth year for this voluntary, non-profit community agency. This sum set a new record, and the 132,640 paid hospital admissions last year cost Blue Cross more per day and more per case than for any comparable period in its history.

Most Blue Cross patients (41,805) stayed in the hospital four to ten days, and the average length of hospital stay was 7.46 days, slightly higher than the 7.24 days averaged in 1953. The in-patient admission rate—the number of subscribers per thousand per year—rose from 104.6 in 1953 to 106.7 in 1954.

LENGTH OF STAY (1954)

31,447 patients stayed in the hospital one to three days, or 34.0%.

41,805 patients stayed in the hospital four to ten days, or 45.2%.

14,891 patients stayed in the hospital eleven to twenty-one days, or 16.1%.

4,347 patients stayed in the hospital over twenty-one days, or 4.7%.

Hospital costs, another basic determinant in the provision of hospital care benefits, continued to follow a rising trend in 1954. For in-patient cases not involving maternity care, Maryland Hospital Service paid an average of \$19.26 per day and an average of \$143.62 per case. Blue Cross made an average payment of \$77.29 for maternity cases, and an average of \$11.89 on out-patient cases.

TOTAL HOSPITAL CASES PAID

1953		1954
76,012	In-patient	73,631
16,776	Maternity	18,319
31,587	Out-patient	40,690
124,375		132,640

Blue Cross had a total income of \$14,588,445 in 1954, out of which 87.6% was paid in benefits for current hospital care and 6.2% was set aside for future hospital care benefits. It required just 6.2% of the total income for administrative expenses.

At the end of the year (December 31, 1954), 878,900 subscribers were enrolled under various plans

offered by the Maryland Blue Cross Plan. This enrollment, highest ever in seventeen years, represented roughly 43% of the eligible population in the State of Maryland, and there was a net increase of some 14,000 subscribers during the year.

DISTRIBUTION OF COVERAGE (1954)

Standard Group	535,731
Special Group	134,379
Group Conversion	206,005
Non-Group	2,785

Group conversion subscribers are those who have left the employed groups where they originally enrolled, and who now are paying their subscription dues directly to Maryland Hospital Service. These group conversion subscribers are not to be confused with those people who have enrolled directly in the Non-Group Membership Program, introduced here in Maryland for the first time last year.

Non-Group Enrollment has made it possible for a significant cross-section of our population—those who are self-employed, those who are not employed, and those who work where there are less than five employees—to join Blue Cross. We are grateful for the splendid cooperation of our member hospitals and our participating physicians in Blue Shield.

The announcement of this non-group program appeared in the public press. Simultaneously, we made similar announcements on radio. This was the first time that Maryland Hospital Service joined with other Blue Cross Plans in a national and local educational campaign using paid advertising media. Already, we have seen some very tangible results from this campaign.

So far, this brief progress report has concerned achievements in 1954. Part of progress, though, is what we plan to accomplish in the future. Many problems face us, particularly the growing public demand for more comprehensive benefits in the hospital and, more and more, the increasing popular interest in prepayment for benefits outside the hospital proper.

Another problem facing Maryland Blue Cross, as well as other Blue Cross Plans, is the matter of national programs for large industrial organizations. Management and labor are speaking in terms of uniform rates and uniform benefits, something not entirely within the traditional local concept of Blue Cross. But, we are confident that Blue Cross can, and should, have a program to meet these needs.

* Executive Director, Maryland Hospital Service, Inc. and Maryland Medical Service, Inc.

Book Reviews*

Acknowledgment of all books received will be made in this column, and this will be deemed by us as full compensation to those sending them.

75 Years of Medical Progress: 1878-1953. Edited by Louis H. Bauer, M.D. 286 pages. Lea and Febiger, Philadelphia, 1954. Price \$4.00.

This book is the outcome of the First Western Hemisphere Conference of the World Medical Association held in Richmond, Virginia, in April 1953. The Conference commemorated 75 years of medical progress and distinguished men from each of 19 medical specialties, as well as a representative of general practice, were invited to contribute papers on the history and present status of their particular fields of medicine. These papers comprise the twenty chapters of this book and the subjects covered are as follows: anesthesiology, dermatology and syphilology, general practice, internal medicine, neurological surgery, obstetrics and gynecology, ophthalmology, orthopedic surgery, otorhinolaryngology, pathology, pediatrics, physical medicine and rehabilitation, plastic surgery, preventive medicine and public health, proctology, psychiatry, radiology, surgery, thoracic surgery, and urology.

For the most part each of these chapters makes an adequate and interesting historical capsule, and there is probably nowhere to be found a more succinct description of the recent milestones in each of the branches of medicine. More than a historical record, however, these chapters include details of latest developments and techniques which afford a synopsis of the often little known current status of our colleagues' specialties. This book's only serious competitor is *Fifty Years of Medicine*, recently published by the British Medical Association, which is rather better written and sells for half the price.

As in most multi-authored volumes there is considerable unevenness in the quality of the chapters: some are written verbosely, some with appropriate simplicity; some authors concentrate on historical review, others

more on current developments; some contributors furnish lengthy bibliographies, others none. Beginning with the editor's foreword, there is a notable lack of humility throughout the text. But the most glaring offence is the inclusion of twenty pages of illustrations—photographs of the authors of the chapters. This immediately impresses the reader as both bad taste and wasted space. Much more dignity and interest would have accrued if these pages had been devoted to the high lights of the subjects treated in the text. Suppose Harvey Cushing had used a photograph of himself as the frontispiece to his *Life of William Osler*.

H. J. L. M.

Ciba Foundation Symposium on Hypertension—Humoral and Neurogenic Factors. Published by Little, Brown and Co., Boston, 1954.

Under the able Chairmanship of Dr. Pickering this Symposium brought together many of the most able investigators in the world. They presented their data concisely and the discussions were searching and to the point. Rather strong evidence was presented by Perera and Grollman that the elevation of blood pressure was but a part, and not always an essential part, of a disseminated vascular disease which we call Hypertensive Vascular Disease.

More precise methods for detecting pheochromocytomas by measuring urinary catechol amines were presented by Goldenberg and von Euler. The search for the humoral factor or factors responsible for the vascular changes in essential hypertension continue to elude their combined efforts.

This Symposium is highly recommended as a splendid reference for the student in hypertension, the physiologist, the biochemist and all interested in the fundamental research of this disease.

S. T. R. R., Jr., M.D.

* The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.



Woman's Auxiliary Medical and Chirurgical Faculty



MRS. JOHN G. BALL, *Auxiliary Editor*

PRESIDENT'S REPORT—1954-55

MRS. ALBERT E. GOLDSTEIN

The Woman's Auxiliary to the Medical and Chirurgical Faculty of Maryland is pleased to report on the progress of the Auxiliary during the sixth year of the organization.

ORGANIZATION AND MEMBERSHIP

Total membership.....	470
Associates.....	25
Members at Large.....	33

Five counties and Baltimore City are organized. There are members at large in 13 other counties.

Favorable letters were received from five county Medical Societies indicating their desire to organize Auxiliaries. The Chairman of Organization is having correspondence with the Doctors' wives of these interested counties. We hope for greater interest and organization soon.

Your President attended the November Conference in Chicago and spoke on the membership panel on "How to Develop Interest in Auxiliary Membership."

PROGRAM

Each county auxiliary planned its program to meet the needs of the community; some have morning meetings, some luncheon meetings, others, afternoon meetings.

Most of the programs used speakers or movies to present a subject such as Civil Defense, Mental Health, report on A. M. A., Legislation, to the Auxiliary. Book reviews and skits were found to add great interest to some subjects.

NURSE RECRUITMENT

The Future Nurses Clubs have made great progress in Maryland this year. They have a statewide organization under the sponsorship of the State Medical Auxiliary. Mrs. James Kerr, Nurse

Recruitment Chairman, and Mrs. D. D. Caples, Co-chairman, have been helping the Future Nurses with their own state organization and planning the convention with them. There are fifty future nurses clubs organized and several in the process of organization. This enrollment extends over all the counties.

These high school girls held a convention at Eastern High School on March 12 from 10 a.m. until 4 p.m. Mrs. C. Pearson, Chairman of National Nurse Recruitment, was an honored guest and speaker. Mrs. D. D. Caples, Co-Chairman of State Nurse Recruitment, was appointed to represent the National Auxiliary on the Executive Board of the Committee on Careers.

The Committee on Careers and the League for Nursing Education are co-sponsors with the Woman's Auxiliary to the Medical and Chirurgical Faculty in planning the Future Nurses Convention in March.

At our Annual State Meeting there will be a coronation of a third year student from a nurse's training school in Maryland. The judges will make their selection on her accomplishments both in academic subjects and clinical ability in the training school. She will be crowned at the Annual Luncheon.

This year, Maryland has awarded four scholarships to pupil nurses. The counties represented are Baltimore County, Prince George's, Montgomery and Washington.

DOCTOR'S DAY

By Governor's proclamation, Doctor's Day was celebrated March 30th. Each organized county has recognized Doctor's Day by pinning a red carnation on the doctor. Some Auxiliaries planned dinner dances, some had luncheons. Many had arrangements of red carnations in the local hospitals.

CIVIL DEFENSE

Throughout the state, Auxiliaries have had meetings with speakers and films on the Civil Defense

Program. One county had a book review of Philip Wylie's challenging novel "Tomorrow."

Some counties have taken home nursing courses this year; some have provided teachers for courses.

LEGISLATION

Mr. John M. Martin, Jr., Secretary of Committee of Legislation for the A. M. A. (recently resigned), was guest speaker at our Semi-Annual Meeting in Hagerstown, Maryland. He talked on Medical Legislation in the second session of the 33rd Congress.

We are receiving material on legislation with medical implications and are asked to review two issues that may culminate this year, (1) V. A. Medical Care and (2) The Government Reinsurance Plan.

AMERICAN MEDICAL EDUCATION FOUNDATION

Baltimore City, Baltimore County and Montgomery County have contributed, this year, to the A.M.E.F. Baltimore City Auxiliary contributed a portion of the proceeds from the Medical-Chirurgical Ball.

PUBLICATIONS

Subscriptions for "Today's Health" and "Bulletin" have increased in the State.

The Editor of the Auxiliary section in the STATE MEDICAL JOURNAL has published a monthly report of some phase of Auxiliary work.

STATE MEETINGS

The State Auxiliary will have held four board meetings and two regular meetings at the close of our Annual Meeting in April.

Baltimore City Auxiliary is planning a third Annual Medical-Chirurgical Ball which will be held during the Annual Meeting week on Friday, April 22nd.

INVITATIONS AND TRAVEL

Your president has visited each organized county during the year.

You were represented at the National Auxiliary Convention in San Francisco in June, 1954.

You were represented at the State Hospital Auxiliary Meeting in July, 1954.

You were also represented at the West Virginia

State Auxiliary Meeting in August, 1954; the National Chicago Conference in November, 1954; and the Pennsylvania State Conference at Hershey in March, 1955.

The Co-Chairman of Nurse Recruitment attended the National "Committee on Careers" meeting in New York, October, 1954.

The State Auxiliary agreed to present Past Presidents with Past President's pins to be worn at State and National Meetings. These were presented to all past Presidents at the Semi-Annual Meeting in September, 1954.

There will be a Creative Arts Show at the Annual Meeting. Doctors and wives will exhibit.

A contest on symbols to be used to head the articles in The MARYLAND STATE MEDICAL JOURNAL will be judged at the Annual Meeting. Doctors and wives will send in sketches for the contest.

We feel that our accomplishments this year have been an effective means of placing us in the role of "Leadership in Community Health."

WOMAN'S AUXILIARY TO THE MEDICAL AND CHIRURGICAL FACULTY

Sixth Annual Meeting

TENTATIVE PROGRAM

Thursday, April 21, 1955

Place: Sheraton Belvedere Hotel

Registration: 9:00-9:30 a.m.

Business Meeting: 9:45 a.m. Mrs. Albert E. Goldstein, President, presiding. Auxiliary Special Reports. Members are urged to attend this session, so they will be conversant with the activities of the Auxiliary.

Necrology: Just prior to adjournment

Adjournment: 12 noon

Luncheon: 12:30 p.m. Ball Room*

Guest Speaker to be announced

Coronation of The Student Nurse of Maryland Music by Dr. and Mrs. Joseph Blum

Presentation of Presidential pin to Mrs. Gerald LeVan by Mrs. Albert E. Goldstein

Presentation of the pin to the Immediate Past

* All members of the Medical and Chirurgical Faculty and their wives are most cordially invited to this luncheon.

President, Mrs. Albert E. Goldstein, by Mrs. Thomas A. Christensen

Friday, April 22, 1955

Past Presidents' Breakfast: 9:00 a.m.

Postconvention Board Meeting: 10:30 a.m.

Medical-Chirurgical Faculty Ball sponsored by Baltimore City Auxiliary, 9:00 p.m. to 1:00 a.m. Ballroom Hotel Emerson.

CREATIVE ART SHOW AND TEA

MRS. E. RODERICK SHIPLEY*

The Woman's Auxiliary to the Baltimore City Medical Society held a Tea and Creative Arts Show on Tuesday, January 25th, in Osler Hall, 1211 Cathedral Street. Mrs. Whitmer B. Firor was chairman for the affair. Mrs. George Wells, Jr. was chairman of the exhibits, with the assistance of Mrs. George Wells, Sr. Mrs. Richard Coblenz presided as chairman of refreshments.

Any one who entered Osler Hall that day would not have recognized it, for it wore a festive air. The center of the room was occupied by a most attractive tea table. An arrangement of white carnations and red roses in a silver epergne flanked by silver candelabra was used as decoration on a white linen cloth. Silver service for either end of the table was attended by hostesses in turn, and delicious sandwiches and cakes were served.

The past presidents of the Auxiliary, Mrs. George H. Yeager, Mrs. H. Hanford Hopkins, Mrs. Albert E. Goldstein, Mrs. Thomas C. Webster and Mrs. E. Roderick Shipley, the current president, acted as

* President, Woman's Auxiliary to the Baltimore City Medical Society.

a welcoming committee, and about twenty members were hostesses serving refreshments. All of the active committee members were presented with corsages of roses that were made by Mrs. Shipley for the occasion.

One hundred artistic creations, the work of thirty-seven exhibitors were displayed on standing panels and tables surrounding the room. Oil paintings, pastels, water colors, pen and ink sketches, and wood carving made up the majority of the display. However, ceramics, dolls, kodachromes, stuffed toys and flower arrangements were also in evidence.

The *Piece de Resistance* was an exhibit of anonymous "doodlings"—perpetrated by the doctors while talking on the phone and in meetings—which had been collected by an employee of the Society. This item aroused more interest in the gathering and by the newspaper representatives present than any other single item. The Sunpapers gave quite a prominent spot on the back page of the *Morning Sun* the following day.

Among the exhibitors were Dr. and Mrs. George E. Wells, Jr., Dr. and Mrs. Lay Martin, Dr. and Mrs. Donald Proctor, Mrs. George E. Wells, Sr., Mrs. Alan Chesney, Mrs. Charles R. Austrian, Mrs. James Frenkil, Mrs. George Yeager, Mrs. Albert E. Goldstein, Mrs. E. Roderick Shipley, Mrs. John Hogan, Jr., Mrs. King B. E. Seegar and Dr. Wilson K. Grubb.

This whole affair was planned as a social get-together and as a forerunner of the Hobby Show that will be held as part of the Annual Meetings where many more exhibitors are expected to display their works.

"An orchid" to Mrs. Whitmer B. Firor who did such a splendid job as general chairman of a fine project.

SLOAN-KETTERING INSTITUTE LECTURES TO BE GIVEN AT MERCY HOSPITAL

A series of lectures by speakers from the Sloan-Kettering Institute for Cancer Research will be given at the Mercy Hospital. The lectures will be on "The Chemical Approach to Carcinoma", "The Physical Approach to Carcinoma", and "Broad Definitions of the Present Therapy of the Surgical Treatment of Carcinoma." Due notice of these lectures will be given when speakers and dates have been assigned.

Coming Meetings

THIRD ANNUAL MEETING—MARYLAND RADIOLOGICAL SOCIETY JOINT MEETING WITH THE RADIOLOGICAL SECTION BALTIMORE CITY MEDICAL SOCIETY

SHERATON-BELVEDERE HOTEL, BALTIMORE, MARYLAND

Saturday, May 14, 1955

10:30 a.m. Registration

1:30 p.m. Scientific Session

11:00 a.m. Business Meeting

6:00 p.m. Cocktails and Reception

12:30 p.m. Luncheon

7:00 p.m. Annual Dinner

A separate program for the ladies is under the direction of Mrs. Richard B. Hanchett.

THE COMMITTEE FOR THE STUDY OF PELVIC CANCER

Sponsored by the Maryland Division of the American Cancer Society and the Medical and Chirurgical Faculty.

RICHARD W. TELINDE, M.D., *Chairman*

BEVERLEY C. COMPTON, M.D., *Secretary*

Faculty Building, 1211 Cathedral Street, Baltimore

Thursday, May 19, 1955

5:00 to 6:00 p.m.

ORTHOPEDIC SECTION*

JOINT MEETING WITH THE WASHINGTON, D. C. ORTHOPEDIC SOCIETY

ALLEN F. VOSHELL, M.D., *Chairman*

WILLIAM P. HORTON, M.D., *Secretary*

Lord Baltimore Hotel, Baltimore

Monday, May 23, 1955

Scientific Session 3:00 p.m.

Cocktails and Dinner to follow

Arthrodesis of the Hip with Intramedullary Nail Fixation. R. N. Lofthouse, M.D., Ontario, Canada.

Long-term Follow-up of Congenital Dislocation of the Hip Treated at Children's Hospital School. R. W. Johnson, M.D., and C. Hopmans, M.D.

Further program to be announced later.

* Section of the Baltimore City Medical Society.

SIX ADDITIONAL INSURANCE COMPANIES CITED BY FTC

The AMA Washington Letter, No. 84-2

Six more insurance companies selling accident and health policies have been accused by the Federal Trade Commission of using false and misleading advertising. Shortly after the complaints were filed a statement issued on behalf of the companies noted that the complaints are not a finding or a ruling, and that they were issued while the companies were cooperating with the commission in investigating practices in the industry.

The companies named are: Sterling Insurance Co., Chicago, Illinois; Combined Insurance Company of America, Chicago; Professional Insurance Co., Jacksonville, Florida; Service Life Insurance Company, Omaha, Nebraska; Postal Life and Casualty Insurance Company, Kansas City, Mo.; and Girardian Insurance Co., Dallas, Texas. Last fall 17 other insurance companies were named in similar charges by the FTC. The new FTC complaints make the following charges, among others, against the six companies:

1. That they represent that benefits are payable in all cases of sickness, whereas many sicknesses actually are excluded from coverage.
2. That the companies advertise that policies remain in effect as long as the policyholder pays his premium, whereas actually they are renewable at each premium time only at the option of the company.
3. That the companies (except Postal Life and Casualty Insurance Co.) falsely advertise that a specified amount will be paid for certain medical, hospital and surgical services, whereas actually the maximum amounts are payable only in a few instances or under special circumstances.

The industry's position was explained by its Joint Committee on Health Insurance, which declared that the complaints "arise out of an investigation, begun with the cooperation of the companies last spring, which prompted the commission to issue complaints against the advertising of 17 other companies last October." The statement said that the insurance industry is continuing to develop advertising standards and practices "in conformance with the advertising codes prepared by the accident and health insurance business several months ago . . . The complaints issued by the commission are based on advertising issued before the advertising codes were developed. The companies . . . are now making every effort to conform with these voluntary codes."

MRS. HOBBY PRAISES REINSURANCE BILL

The AMA Washington Letter, No. 84-6

In a news conference the day after President Eisenhower's special health message, HEW Secretary Hobby praised reinsurance and other administration recommendations. She said that the reinsurance bill carries out the "basic principles" of the bill defeated last year, but that it is "more specific." This year's bill cites certain problem areas as appropriate fields for reinsurance; last year's bill did not specify particular areas, but left this open. The news conference brought out that although individual, private physicians would be eligible for mortgage guarantees under another administration bill, such requests "are not anticipated." The Secretary would be authorized to set minimum and maximum amounts of guarantee, which might rule out guarantees for mortgages for individual physicians. Questioned about her own views on U. S. aid to medical education, the Secretary merely said she was supporting the President's program, which does not include assistance to medical schools.

REPORT WARNS OF POSSIBLE 'FRUSTRATIONS' FROM DOCTOR DRAFT

The AMA Washington Letter, No. 84-7

A report by the Health Resources Advisory Committee of the Office of Defense Mobilization warns that young physicians may come to look upon the two years of obligatory military medical service as "the penalty and inescapable frustration" of having chosen a medical career. The report says that it is the joint responsibility of civilian and military medicine to insure that "vigorous teaching and learning" are provided these young medical officers, who "have good reason to distrust a leisurely tempo of professional work" and who "distrust idleness even if it be in the name of adequate staffing." The ODM committee is under the chairmanship of Dr. Howard A. Rusk.

On military medical manpower the report makes two other points: (a) Morbidity records show that the health of the uniformed men is at an all-time high, despite sharply reduced ratios of physicians to troops since World War II, and (b) the military requirements for an adequate supply of senior officers and specialists cannot be met by the regular draft, although the draft will supply all the younger physicians needed by the services.

Data on the utilization of total medical manpower, some of which had been released earlier in different form, are presented in the report. Some of these points: Although medical schools have expanded from 5,100 graduates in 1940 to 6,800 in 1954, the report claims the increase is offset by increasing population and the earlier retirement of physicians. The report forecasts continuing shortages of physicians, dentists and other health personnel "for many years to come."

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RESERVE PLAN HEARINGS CONTINUING INDEFINITELY

The AMA Washington Letter, No. 84-7

With the House Armed Services Committee just beginning its hearings and a long list of witnesses yet to be heard on the administration's controversial reserve training program, hearings on the doctor draft may not be scheduled until April. Also undecided is whether to take up the doctor draft before considering the administration's program for increased medical care for servicemen's families. This program would cost \$58.8 million a year in addition to the \$68 million the Pentagon estimates is being spent at the present time.

As an indication of the temper of Congress on military matters, the House on February 8 voted overwhelmingly (394 to 4), after only brief debate, the Administration's request to extend the regular draft another four years beyond next July 1. The Administration wants the doctor draft extended two more years beyond July 1.

SEVEN MORE SCHOOLS JOIN IN 'MENDS' PROGRAM

The AMA Washington Letter, No. 84-7

Seven additional medical schools have agreed to broaden and modernize their curricula in military research and military medicine under the Defense Department's "MENDS" program—Medical Education for National Defense. Joining Buffalo, Illinois, California, Vanderbilt and Cornell will be Georgetown, Ohio State, Pennsylvania, Virginia, Baylor, Tufts and Wisconsin. Three other schools will be brought in later for a total of 15. An indoctrination tour is scheduled for March 5 through 12, on which representatives of the new schools will visit a number of selected military medical installations. The military will furnish training aids and conduct symposia for instructors, but the courses will be the responsibility of the schools.

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VETERANS ORGANIZATIONS DIFFER ON VA ADMISSION FORM

The AMA Washington Letter, No. 84-8

In hearings before the House Veterans Affairs Committee, representatives of the American Legion, Amvets and the VFW came up with different views on the amended admission form (10-P-10) designed to discourage abuses of the VA medical and hospital program. Amvets commented favorably that "it served as a deterrent, keeping away many of those who could well afford to pay . . .," while the VFW held that it was not justified and "in some cases it requires an unwarranted disclosure of personal information." The Legion stated that there were only a few cases where "the application has been withdrawn when those seeking hospital care have faced the questions in 10-P-10."

Included in the organizations' legislative recommendations were accelerated construction of hospital and domiciliary facilities rather than repair of temporary structures scheduled for demolition, and an increase in disability compensation rates.